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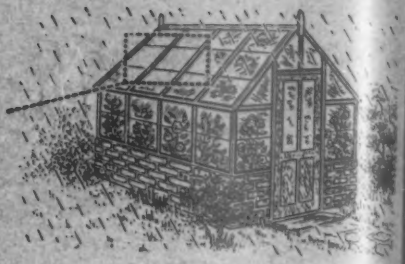

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THE QUEEN
HER MOST GRACIOUS MAJESTY
QUEEN ELIZABETH THE QUEEN MOTHER
H.R.H. THE PRINCESS ROYAL

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THE ROYAL HORTICULTURAL SOCIETY

ANNUAL GENERAL MEETING

FEBRUARY 18, 1958

REPORT OF PROCEEDINGS of the ONE HUNDRED AND FIFTY-FOURTH ANNUAL GENERAL MEETING of the Fellows of the Society, held in the Old Hall, Vincent Square, Westminster, on Tuesday, February 18, 1958, at 3 P.M.

The Hon. DAVID BOWES LYON, V.M.H., President, in the Chair.

Notice of Meeting

The SECRETARY read the Notice convening the Meeting.

Confirmation of Minutes

The Minutes of the last Annual General Meeting, which had been circulated to all Fellows in the Society's JOURNAL for April, 1957, were approved by the Meeting and signed by the President.

Report of the Council—Presidential Address

The PRESIDENT, in moving the adoption of the Report of the Council, said: Once again I extend to all Fellows here today a very warm welcome to this our Annual General Meeting. We are very glad to see you here. I do hope this year you may be able to hear me better than last year, when I was told that only half of what I said was heard at the back of the hall. I do not know whether it is that I speak badly, or that these microphones are very temperamental things. I sometimes think they are rather like those deaf people who never hear what they are meant to hear, but invariably do when they are not meant to do so.

They rather remind me of an elderly lady who was called upon for a subscription for the local horticultural society. The Treasurer of that Society, the Whitehill Horticultural Society, knocked at the door. She answered it, and he said: "I have come to ask if you will subscribe to the Whitehill Horticultural Society". The elderly lady said, "What?" He repeated it, and again she said, "What?" and then she said, "Wait a minute, I will go and get my hearing aid". She returned with her hearing aid, and the Treasurer said, "I have come to ask you, Madam, if you will subscribe to the Whitehill Horticultural Society", and again she said, "What?" He lost patience and turned and walked down the garden path. When he got to the gate, the old lady shouted out, "Mind you shut the gate after you". He, by then having lost his temper, said in a low voice, "Oh, curse the rotten gate!" and from the steps by the door came a voice saying, "And curse the rotten Whitehill Horticultural Society!"

Now, Ladies and Gentlemen, it is again my pleasure to report to you a prosperous year. We continue to grow; in fact, we have grown a little bit faster than we did the year before last. You will have seen in the JOURNAL our membership figure: it is some 53,600—a very satisfactory total. That total is a net total after striking off all those who for some reason did not pay their subscriptions last year, and those who have died or resigned. The actual individual Fellows numbered 49,994. I said to the Secretary, looking at these figures, "I can tell the Annual General Meeting we have now got to 50,000 Fellows", but he said, "Oh, no. We are six short". He did that, when he knew, and I knew, and I think he knew I knew, that in the tray in the office there were over 400 applications for election which only had to wait one week for the Council to meet before the applicants became Fellows too; but he is such a stickler for accuracy that I have to say that at the end of the year the total number of Fellows was 49,994. In the six weeks of 1958 we have elected no fewer than 1,374 new Fellows. (*Applause.*)

Here I must add a warning note. We do need those new Fellows badly, and we want to go on getting more and more Fellows in this great Society, because we need more subscriptions to meet greater expenses due to continuing inflation. We have a steady subscription, which I hope we shall never have to raise, so we get the same amounts from you Fellows every year, but everything we do goes on costing a little bit more every year. The way we can meet the extra cost is by getting more Fellows, therefore the help you have given us last year we hope you will continue to give us by seeking new Fellows to join our Society.

I will give you one example of the ways in which our expenses are rising. The new increase in postage rates which you have all suffered is costing the Society about £6,000 more a year. A great deal of that is in the postage of our JOURNAL.

In connection with the subject of rising costs we have come to the conclusion that it is no longer economic to provide the privileges of Overseas Fellows for an annual subscription of only one guinea. So, with great reluctance we have to say to our good friends, our Fellows overseas, that we must ask them to go back to the days before the last war and be on an exact par with all our Fellows in the United Kingdom. Later on today I am going to ask you to adopt a resolution to that effect.

You will remember last year I discussed the question of the numbers of people now coming to our Gardens at Wisley. In 1956 there were already days when the crowds were uncomfortably large. I told you last year we would watch the situation carefully in 1957 after petrol rationing ended, and as it turned out there is no doubt there were a number of days in which it was uncomfortably crowded, and our Fellows, for whom the Gardens are primarily there (and after all, it is you Fellows who pay for their upkeep) could not really get a proper look and study all the plants which we grow for you. So we thought the best thing to

do was to reduce the number of people Fellows could take into the Gardens with their tickets, and that has been announced in the JOURNAL. Each ticket will now only allow two in; by and large, your Council has had a lot of support for this change, and, I admit, a few criticisms too. We expected that; it is not a pleasant thing to have to do, but it is equally unpleasant when the Gardens no longer are a source of pleasure. We are going to keep a sharp eye on this situation this summer, and we shall not hesitate to make a further change. If there are no crowds any more, we may be able to put something back, but if things are still as bad, we may have to take further steps. I thought I would tell you the position as it stands.

At Chelsea: last year we started our new time-table, and I think on the whole Fellows approved of that. The whole of Tuesday is now a Private View day, and at no time during the whole of that day were the crowds too big; so we propose to make that permanent.

There was one difficulty that arose. Any Fellow subscribing three or four guineas found that, unless he and his friend were able to go to the Show at the same time, the friend could not get in. We have overcome that problem. This year the personal ticket issued to a Fellow subscribing three or four guineas has two detachable parts, so that the Fellow and his friend can go in at different times if they so wish.

I have to report that the Council thought it was right for the Society to be represented at the Second World Orchid Conference in Honolulu in September. We were able to persuade Mr. Gilmour (who I am sorry cannot be here today) to represent the Society at that Conference. He did a great job there, and in no time he put the prestige of The Royal Horticultural Society on a very high level at the Conference. Indeed, whether or not it was altogether the result of his being there, there was a general desire on the part of the Conference that the next one should be held in London. We have agreed it should be held here in 1960, and we and the British Orchid Growers' Association and the American Orchid Society are going to get together to arrange this Conference the year after next.

Another small matter of relationship between ourselves and the New World: when I was in America last Spring I was invited to Boston, and there I was presented, as representing your Society, with the George Robert White Medal of Honor from the Massachusetts Horticultural Society. My wife and I were most cordially received, and we were banqueted, and the President, Mr. Ames, duly presented me with this Medal, which is a rare thing to come by, and which is here for anybody who would like to look at it after the meeting.

We have now completed the buildings at Wisley which we have been undertaking on Battleston Hill. We do not intend to do any more at present: indeed, I do not think we can afford to; but those buildings were badly needed, and have filled a long-wanted requirement.

What we do want to do in the next year or two, and here I am sure you will all be with us, is to complete the reconditioning of our housing

there. We have done a lot since the war, built a number of new houses for our staff, and reconditioned a number of our cottages, but not all. I am sure it will be your wish to see that all our houses are up to present-day standards in all respects. That is our next target at Wisley.

Also in regard to Wisley, I should like to say I think, and I hope you will find, the Garden as good as ever. This time last year I had to tell you of the serious illness of our Curator, Mr. Hanger. We were without him for three or four months, but he has now returned wholly restored to health and full of vitality. He is really in harness again, and I think I can promise he will see that your Garden is as good as ever.

Things are always happening at Wisley, as they should in all gardens. One new feature which you will find this year is a corner called Bowles's Corner. In it are collected a large number of plants which are what Mr. Bowles used to call his "demented plants". He had a corner at Myddelton House which he used to call his lunatic asylum. These demented plants lived there. We have collected as many of these as we can and put them in a corner at Wisley, together with a seat, with which his friends at Forty Hill presented us. You will find it most interesting, but many of you, who remember that great gardener, will be glad to feel there is some memorial to him there for all time.

One word about publications: we have done our usual regular publications, our *Journal*, our *Year Books*, our *Handbooks*, but we are undertaking this year the publication of a new book on Camellias. It is going to be a really authoritative volume with all the up-to-date information on the genus *Camellia*. It is perhaps a book for the more erudite. It will, we think, be sought after by Camellia enthusiasts, particularly in North America, and it is the sort of thing this Society should undertake from time to time, which is to produce a horticultural book on the highest level.

To balance that, at the other end of the scale, at long last this year a series of Penguin Books is also coming out. You will find them easy on the eye, but also quite accurate, because they are produced under the aegis of the Editor and the Publications Staff. They will tell countless thousands of people, how to garden.

Two other things we are publishing: at the last International Horticultural Congress in Holland last year we were asked whether we would be the international registration authority for Daffodils and Rhododendrons. Quite a work, but quite an honour to be asked to do it. The World Congress thought we were better able to do it than any other country, and we accepted these tasks.

In the case of Daffodils, a new edition of the *Classified List of Daffodil Names*, which now also becomes the International Register, has been prepared and will be published in a few weeks. This work has been carried out by our Staff under the supervision of the Secretary, in what he calls "spare time", though when that can possibly be I have never been able to discover.

We have been equally fortunate in getting Dr. Fletcher to do the

List of Rhododendrons, which includes Azaleas. That is finished, and is in typescript, and I hope that will be out soon.

These two solid works which our Society has done will be the recognized official registers of the names of those plants throughout the world, and will get rid of a great deal of confusion. (*Applause.*)

Your Council has been considering the question of whether some recognition should not be made to some of those men and women who have spent the whole of their lives in one single garden, or nursery, or horticultural establishment. They are the people who really know what to do, and why it is done, and when to do it, but they generally do not show themselves up very much: they are the backbone of the garden. So we propose to create a Long Service Medal for Gardeners. We have not got all the details finished yet, but I hope by this time next year the first batch of men and women with forty years or longer with one employer or one establishment, will receive a Long Service Medal from The Royal Horticultural Society. (*Applause.*)

I always have to say one word of thanks (and I feel very deeply about it) to the members of our Committees who do so much work for us. I suppose rather less than one per cent of the Fellows serve on Committees, and I do not think the other ninety-nine per cent have a clue just how much work they do. I asked them upstairs to find out how many Committee meetings were held in 1957, and it was 366 meetings. Your first reaction will be to say, "Much too many, cut them in half", but we never hold a Committee unless there is work to be done and decisions to be taken. There it is: this Society had to hold over 360 Committee meetings and the work was done by a comparatively few people who gave their time—and not their leisure but their work time—to come and do this work. What is more, they go on doing it year after year.

The Chairman of our Orchid Committee, Mr. Curtis (I do not think he is here today) has just completed fifty years on that Committee, and he has completed fifty-four years on the Narcissus and Tulip Committee. He only just beats that other great stalwart, Mr. Leak, the Chairman of the Narcissus and Tulip Committee who has been fifty-two years a member of the Committee. Both Mr. Curtis and Mr. Leak are still going strong. (*Applause.*)

I extend our warmest thanks to the Council and to all members of Committees who come and work for us: I do not know how we would get on without them. (*Applause.*)

At this juncture it is usual for me to sit back in my chair with relief and hand over the reins to the Treasurer, who then regales you with lots of figures on the Accounts. The Treasurer is away, and has been away for nearly three months, playing truant in East Africa. In his absence, Sir Frederick Stern very kindly agreed to be Acting-Treasurer. Then, as some of you know, some six or seven weeks ago Sir Frederick Stern became seriously ill, and has not been able to act as Acting-Treasurer. I am glad to tell all his friends I had a letter from Sir Frederick Stern yesterday: he is enormously better, up and about, and he hopes to be

back in the hall in the course of the next month. That is very good news.

So there has been no Treasurer and no Acting-Treasurer these last few weeks. Your President has had to become "acting" Acting-Treasurer, a job not particularly new to him because he used to be Treasurer some years ago. (*Applause.*)

Therefore it falls to me very briefly to report to you on the financial position of the Society. I am glad to tell you it is still solvent. Its revenue rose a little last year; so did its expenditure, and that takes me back to what I said earlier, that we must have more subscriptions to meet additional expenditure. We did manage to come out with a slight balance in our favour. True, revenue was up £10,000, partly from subscriptions, partly because the halls let very well last year; though I am not sure whether that will happen this coming year. Wisley cost us rather more. We saved a little money on publications.

We set aside certain sums towards commitments which we know we will have to meet in the next year or two, all of which are set out in the Accounts and Balance Sheet.

One particular thing I should like to say is that we have set aside this year £2,000 to the Supplementary Pension Fund. That is a Fund dear to my heart because I started it, and it is there in order to cushion or increase the pensions of individuals on our staff who, for the reason that their pensions were calculated on pre-war salary scales, or through ill-health have had to retire prematurely and would find their pensions inadequate under present-day conditions. This fund will help those people who have served the Society well and will give them reasonable pensions when they retire. I am sure you, Ladies and Gentlemen, will support me in making that allocation. (*Applause.*)

The only other thing to which I have to draw attention as Acting-Treasurer is this: those of you who have seen the Accounts will notice our Investments show a big depreciation on cost. In fact they are worth £57,000 less than what they cost us to buy. That sounds a very big sum, and indeed it is, but I would remind you, most of those investments were acquired by the Society in the years when we had what is known as cheap money, or when the Bank Rate was 2½ per cent. With the Bank Rate at 7 per cent and money being dear, the value has fallen as the Bank Rate has gone up, but similarly if, as I presume will happen some time, the Bank Rate goes down, so will that loss of £57,000 diminish. Indeed, as all our gilt-edged stocks are redeemable at some future date, we shall not in the long run make any losses. I want to explain that, as some of you may have been disturbed to see these figures in the Balance Sheet.

That is all I want to say about the Accounts.

I therefore beg to move "that the Report and Accounts of the Society be adopted", and will ask Mr. Secrett to second that.

Mr. F. A. Secrett said: Our President has moved that the Report and Accounts be adopted. I have much pleasure in seconding that motion.

The PRESIDENT: The adoption of the Report has been moved and seconded. Before I put it to this meeting, if anyone has any questions to ask, we will do our best to answer them.

(There were no questions.)

(*The motion for the adoption of the Report was carried unanimously.*)

Election of the President for 1958

Mr. E. P. F. SUTTON: It is my great pleasure to announce, and will be your pleasure to hear, that only one name has been put forward for the office of President, and therefore, under Bye-law 69, the Honourable David Bowes Lyon is our President for the ensuing year.

I am sure you will all agree we have a wonderful President. We are most fortunate, because you know with many societies, I expect you have found this yourselves, the President only appears once a year. However, with our President it is very different. He presides over every Council Meeting, and keeps us in order: he presides over and also attends many Committees, but beyond that, he also does, as some of us know, a tremendous amount of spadework behind the scenes (I am not sure it is not double digging, I think it is), but we are grateful to you, Sir, for all you do. I am sure we are delighted to think you are going to carry on for another year as our President. May I, in conclusion, say this: I hope sincerely that you will be spared to be with us for many years as President of The Royal Horticultural Society. (*Applause.*)

The PRESIDENT: Mr. Sutton, Ladies and Gentlemen, I would only say this: I think it is the greatest honour that has come my way, to be your President these last few years. It is a wonderful Society to preside over: everybody is so helpful and keen, that it is a real enjoyment to work for it. If I ever wanted to double dig for any body, it would be for this Society. I assure you, as you have put your confidence in me, I will do my best on behalf of you all. Thank you very much. (*Applause.*)

Election of five Vice-Presidents, a Treasurer, three Members of Council and an Auditor

The PRESIDENT: In accordance with Bye-law 69, I have to declare that the following are duly elected as Vice-Presidents: Sir Ronald G. Hatton, Mr. G. W. Leak, Mr. F. Cleveland Morgan, Mr. B. Y. Morrison, Sir Edward Salisbury.

I also have to declare, under the same Bye-law, that the Hon. Lewis Palmer is appointed as Treasurer.

Under the five-year rule, we lose three members of Council, Sir Frederick Stern, Mr. H. G. Hillier and Mr. Stuart Ogg. In their place we welcome Lord Aberconway, Sir Eric Savill and Mr. G. L. Pilkington.

I also have to declare the reappointment of our Auditor, Mr. F. G. Feather, who gives us so much help.

Resolution re Overseas Fellowship

The PRESIDENT: I also move

"That the form of fellowship called 'overseas fellowship' be discontinued on and after January 1, 1959, and that Bye-laws 5 and 6 relating to Overseas Fellows and all other references to Overseas Fellows elsewhere in the Bye-laws and the Appendices thereto be revoked and that after February 18, 1958, candidates wherever resident shall be admissible as Fellows subject to the same provisions as are contained or referred to in Bye-laws 3 and 4 relating to candidates residing in Great Britain, Northern Ireland, Eire or the Channel Islands."

(*The motion was carried nem. con.*)

Presentation of Annual Awards

The PRESIDENT then presented the following awards:—

The Victoria Medal of Honour—Awarded to British Horticulturists, resident in the United Kingdom, whom the Council consider deserving of special honour at the hands of the Society.

To Mr. W. M. CAMPBELL.

The PRESIDENT: Mr. Campbell, it gives me very great pleasure to present you with the Victoria Medal of Honour. You do not need any introduction here, being Curator of that Mecca of all gardeners, Kew Gardens. It is a very great position, deserving of the highest honour we can give, and I congratulate you.

To Mr. H. G. HILLIER.

The PRESIDENT: I hardly think you need an introduction to the assembly here. We know you as one of the great and acknowledged authorities on all trees and shrubs, and for that and for the many other good works you have done for horticulture, I am delighted to present you with the V.M.H.

To Mr. J. L. RUSSELL.

The PRESIDENT: You also are a great authority on trees and shrubs, but you are also a great authority on stove and greenhouse plants. For these two reasons alone the V.M.H. is due to you; but you have also done for this Society and for horticulture generally many other good things, not only in this country, but overseas as well, For those reasons it gives me great pleasure to present you with the V.M.H.

Honorary Fellowship—

To Dr. J. F. ROCK.

The SECRETARY: Dr. Rock is unfortunately unable to be here; he is in Honolulu.

The Associateship of Honour—Conferred on persons of British nationality who have rendered distinguished service to Horticulture in the course of their employment.

On Mr. W. AUSTIN.

The PRESIDENT: You have given pleasure to countless numbers for one specific thing you did since for many years you maintained in all its glory Queen Mary's Rose Garden in Regent's Park. That was a wonderful thing you did for the people of London, and for rose lovers, and I am delighted to present you with the Associateship of Honour.

On Mr. J. T. CALLER.

The PRESIDENT: We know that for many years you have been particularly associated with the shrub and rhododendron side of Messrs. Waterer, Sons & Crisp. Many times we have enjoyed your excellent exhibits in our Halls, and at Chelsea, during the past twenty years and I confidently hope we shall continue to admire them for many years to come.

On Mr. A. R. CONINGSBY.

The PRESIDENT: I believe you live amongst orchids, and have been for many years with Messrs. Sanders of St. Albans. You are, I believe, 78 years old, and I am told you intend to go on living with orchids for many years to come. I have very much pleasure in presenting you with the A.H.

On Mr. T. H. FINDLAY.

The PRESIDENT: This is not the first time you have been up to this desk to receive an Honour from The Royal Horticultural Society. We all admire the remarkable team-work between Sir Eric Savill and yourself, and the amazing results that have thereby been achieved at Windsor. I have great pleasure in presenting you with the A.H.

On Mr. W. H. HOLLOWAY.

The PRESIDENT: I believe you are at Reading University, but that for many years you were a gardener at Tewin. I can remember a long time ago those beautiful plants of *Vanda coerulea* you used to grow so well there. I have much pleasure in presenting you with the A.H.

On Mr. J. H. KING.

The PRESIDENT: I believe you were for no less than thirty-six years head gardener to Leeds University, and that the improvements you made in that time were remarkable. I am delighted to present you with the A.H.

On Mr. C. E. MASON.

The SECRETARY: Mr. Mason is unfortunately unable to attend, because of Mrs. Mason's illness.

On Mr. C. E. PUDDLE.

The PRESIDENT: You are in charge of one of the greatest gardens in the country—Bodnant. Eleven years ago you succeeded your father there and with the Lord Aberconway and his father you have made the garden at Bodnant one of the monuments of horticulture.

One of the reasons for which I should like you to feel you are getting this A.H. is because of the specialist knowledge you have gained by your study of the genus *Camellia*. Your reputation is growing all over the world for your work on that particular genus. Last year in Los Angeles twice your name was mentioned as one of the authorities on camellias. Therefore I have great pleasure in presenting you with the A.H.

The Veitch Memorial Medal—Awarded to those who have helped in the advancement and improvement of the science and practice of horticulture.

To Mr. ROY HAY, for services to horticulture.

The PRESIDENT: We have all read you in the daily Press and we have read you in the weekly periodicals for many years, and been enlightened on the air by what you have told us on how to grow things. You have undoubtedly by your work greatly increased the love of gardening. We have not only read you, but we have listened to you as well, and therefore I am going to ask you, when you have received this Medal, to turn round so that everybody can see what you look like in the flesh.

To Mr. H. ROBINSON, for his work in raising new roses and pyrethrums.

The PRESIDENT: You have spent a large amount of your life raising new roses and pyrethrums. Their numbers are legion, and I would mention two because we all know that lovely rose 'Christopher Stone', and the pyrethrum 'Eileen Robinson'. I have much pleasure in presenting you with this Medal.

To Mr. PATRICK SYNGE, for his work as Editor of the Society's publications.

The PRESIDENT: You have been our Editor for twelve years now, and in charge of all our publications, and they are very numerous. It is a great and responsible work. Perhaps one of the greatest things you did was when you took over the last stages, from Mr. Chittenden, of the publication of the R.H.S. *Dictionary of Gardening*. That great work which you completed has met with great success, and still goes full steam ahead. For that, and many other works for this Society and for horticulture, I have pleasure in handing you this Medal.

To Prof. T. WALLACE, for services to horticulture and particularly for his work on trace elements.

The SECRETARY: Professor Wallace is unable to be here, as he has had to go to the West Indies to advise horticulturists there on the subject on which he is such a great authority.

To Mr. W. J. W. MITCHELL: Silver Medal and £25 for his work at the Westonbirt Arboretum.

The SECRETARY: Mr. Mitchell is unable to be here, as he is eighty-three and not able to travel.

The Loder Rhododendron Cup—Awarded for work in connection with rhododendrons.

To the EARL OF STAIR.

The SECRETARY: The Earl of Stair is unable to be present; he is on his way to Bermuda. His gardener, Mr. Rye, is here.

The PRESIDENT: I never know whether these rhododendrons which come from Lochinch are Lord Stair's or Mr. Rye's: I think they belong to both. But they are always of a very high quality and lovely as well.

The Jones-Bateman Cup—Awarded triennially for original work in fruit cultivation.

To Dr. A. F. POSNETTE, for his work on virus diseases of fruit.

The PRESIDENT: I understand you have been doing intensive research on the virus diseases of fruit, and with some success. As a layman in these scientific matters I am hoping perhaps in the course of your researches and successes you may be able to introduce for people like me a virus-free raspberry or virus-free strawberry, when we should all be very happy to bless you. In the meantime I have pleasure in presenting you with this Cup.

The A. J. Waley Medal—Awarded to a working gardener who has helped in the cultivation of rhododendrons.

To Mr. C. E. PUDDLE.

The PRESIDENT: Mr. Puddle, like your father, you not only cultivate rhododendrons, you raise them, and you have raised many beautiful new hybrids, and I think you are a worthy recipient of this Medal.

The Lawrence Medal—Awarded for the best exhibit shown to the Society during the year.

To Mr. STUART OGG, for an exhibit of dahlias on September 24.

The PRESIDENT: We all admired those dahlias you showed us in the Autumn; your exhibits are always first-class. The pundits upstairs, when discussing who should get the Medal, were of the unanimous opinion that, although your dahlias are always very good, on this occasion they were superb, and worthy of the Lawrence Medal.

The Williams Memorial Medal—Awarded for the best group of plants and/or cut blooms of one genus which show excellence in cultivation.

To Lt.-Col. the LORD HOTHFIELD, for an exhibit of cymbidiums on March 5.

The SECRETARY: Lord Hothfield is in hospital, but Lady Hothfield is here to receive the Medal.

The PRESIDENT: I do hope Lord Hothfield is better. We are so sorry not to see him today, but I am delighted to present you with this Medal for that lovely group of cymbidiums which we all enjoyed so much.

The Holford Medal—Awarded for the best exhibit of plants and/or flowers shown by an amateur during the year.

To Col. E. J. S. WARD, for an exhibit of begonias and gesnerias on October 22.

The PRESIDENT: It was a most delightful exhibit, and it came in October and cheered us all so much: they were beautifully grown. There was no doubt about the decision that you should receive this Medal.

The Reginald Cory Memorial Cup—Awarded with the view of encouraging the production of hardy hybrids of garden origin to the raiser of a plant which is the result of an intentional cross.

To Messrs. L. R. RUSSELL LTD., for *Viburnum* × 'Anne Russell'.

The SECRETARY: Mr. W. H. Little is here to receive the Cup on behalf of his firm.

The PRESIDENT: I am told you are responsible for the marriage of *Viburnum* × *burkwoodii* and *Viburnum carlesii*, which produced this remarkable plant. It is a very lovely plant, and will probably prove one of the best viburnums for garden use. For this excellent cross which you made I have very much pleasure in presenting you with this Cup.

The Sander Medal—Awarded to the exhibitor of the best new greenhouse plant of general utility shown to the Society during the year.

To Messrs. BLACKMORE & LANGDON, for Begonia 'Golden Harvest'.

The SECRETARY: Mr. Stephen Langdon is here to receive the Medal on behalf of his firm.

The PRESIDENT: I remember that plant, together with three or four other superb plants at Chelsea. I am very glad I was not on the panel to decide which was the best: they were all beautiful. Apparently this plant was voted the best, and for that the Sander Medal is yours.

The George Moore Medal—Awarded for the new cypripedium shown to the Society during the year which shows the greatest improvement on those of the same or similar parentage.

To Messrs. R. & E. RATCLIFFE, for Cypripedium (Meadowsweet g.) 'Purity'.

The SECRETARY: Mr. R. Ratcliffe is here to receive the Cup on behalf of his firm.

The PRESIDENT: That was a lovely plant. It rather reminded me of the days when my predecessor, the late Lord Aberconway, used to specialize in these beautiful plants.

The Gordon-Lennox Cup—Awarded for the best exhibit of fruit.

To SHENLEY HOSPITAL (gardener, Mr. S. L. Lord), for an exhibit of apples shown on October 8.

The PRESIDENT: Mr. Lord, I do congratulate you on a magnificent display of apples which you gave us. We all know you have a great collection of apples, but to bring them up here was a great education for us and of the public, and is doing a very good work. I am delighted to hand you this Cup.

Vote of Thanks to the Chairman

Brigadier C. E. LUCAS PHILLIPS: I am sure all of us here have learned to admire very much the way in which the President presides over the business of our Society, and we are all very grateful for the way he and the Council have maintained the repute of the Society in the eyes of the world. The labours of love are the sweetest. We feel sure, Sir, that your office has been a labour of love and we hope that you have also found it sweet. None the less, we owe you our thanks, and, as the "other ranks" in this horticultural army, we acknowledge the worth of your leadership and add our warm personal regard. I have now no doubt that under you and our Council the Society will continue to flourish. Ladies and Gentlemen, I have much pleasure in moving a hearty vote of thanks to our Chairman.

Mr. WILL INGWERSEN: It is my very great pleasure and honour to second the vote of thanks to the Chairman, proposed by Brigadier Lucas Phillips, and I do so whole-heartedly on behalf of the nurserymen Fellows of the Society who are now, as always, deeply appreciative of the co-operation and assistance they receive from the Society.

(*The motion was carried with acclamation.*)

The PRESIDENT: Brigadier Phillips and Mr. Ingwersen, I thank you very much for the very nice things you have said, and you, Ladies and Gentlemen, for the vote of thanks you have accorded me. I would only like to say I have thoroughly enjoyed the meeting here this afternoon. I would like to point out to you Fellows that it has taken us twenty minutes shorter than usual to get through this meeting, so you cannot complain I have kept you too long.

You have asked me to be your President one more year, and I shall look forward very much in a year's time to seeing you all here in this hall once again.

Thank you very much.

(*The Meeting then terminated.*)

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

VOL. LXXXIII PART FOUR

April 1958

THE SECRETARY'S PAGE

ANNOUNCEMENTS—APRIL AND MAY

Shows

TUESDAY, April 1 12 NOON to 6 P.M.	Fortnightly Flower Show and Daffodil Competition, in the New Hall.
WEDNESDAY, April 2 10 A.M. to 5 P.M.	Alpine Garden Society's Show, in the Old Hall.
TUESDAY, April 15 12.30 P.M. to 6 P.M.	Fortnightly Flower Show, Camellia Competition, and Sewell Medal Alpine-house and Rock-garden Plant Competition for Horticultural Traders, in the New Hall.
WEDNESDAY, April 16 10 A.M. to 5 P.M.	Daffodil Show, in the Old Hall.
TUESDAY, April 29 12.30 P.M. to 6 P.M.	Fortnightly Flower Show and National Rose Society's Competition, in the Old Hall.
	Rhododendron Show, in the New Hall.
WEDNESDAY, April 30 10 A.M. to 5 P.M.	National Auricula and Primula Society's Competition (April 30 only), in a Committee Room in the New Hall.

Chelsea Show

TUESDAY, May 20—(Private View) 8.30 A.M. to 8 P.M.
WEDNESDAY, May 21—8.30 A.M. to 8 P.M.
THURSDAY, May 22—8.30 A.M. to 8 P.M.
FRIDAY, May 23—8.30 A.M. to 5 P.M.

Particulars of the availability of Fellows' and Associates' tickets are given on the tickets.

Lectures

TUESDAY, April 1, at 3 P.M. "Choice Rock Plants", by MR. R. C. ELLIOTT.

TUESDAY, April 15, at 3 P.M. "Camellias and their cultivation", by MR. F. E. W. HANGER, V.M.H.

TUESDAY, April 29, at 3 P.M. "Glimpses of Horticulture in the United States and Honolulu", by MR. J. S. L. GILMOUR, M.A., F.L.S., V.M.H.

Demonstrations at Wisley—The following demonstration will be given at Wisley, that on the second day being a repetition of that given on the first.

May 14–15. Summer Pruning of Shrubs. (Commencing at 2 P.M.)

Camellia Competition—The annual Camellia Competition will be held in conjunction with the Fortnightly Show on April 15 and 16. The Schedule, which may be obtained on application to the Secretary, is similar to that for last year's Competition but contains a new class for *Camellia saluenensis*.

Rhododendron Show—The annual Rhododendron Show will be held in conjunction with the Fortnightly Show on April 29 and 30. The Schedule may be obtained on application to the Secretary.

Lily Group Meeting—The Lily Group will hold its first meeting of the year in the Restaurant of the Old Hall at 4.30 P.M. on Tuesday, April 29, when there will be a discussion on "The Vegetative Propagation of Lilies".

The Restaurant at Wisley—The Restaurant in the Gardens will be open at the following times during 1958:

March 26 to October 12 (excluding Good Friday)

Weekdays: 10.30 A.M. to 6 P.M. (or sunset, whichever is the earlier).

Sundays: 2 P.M. to 5.30 P.M. (to last Sunday in September).
2 P.M. to 4.30 P.M. (Sundays, October 5 and 12).

The restaurant will provide a cafeteria service of cold lunches (weekdays only), sandwiches, cakes, tea, coffee and other light refreshments. There will also be a waitress service for hot lunches on weekdays. The restaurant is licensed for the service of alcoholic refreshments with meals.

Reservations for teas by large parties may be made only for Mondays (excluding Bank Holidays) to Fridays. Organizers should make arrangements, not with the Society, but direct with the caterer, Mrs. D. Badcock, The Oak Cottage, Shere, nr. Guildford, Surrey (*Tel.* Shere 168).

Picnicking is not allowed in the Gardens.

Scottish Rock Garden Club's Show—The Scottish Rock Garden Club's Show will be held in the Y.M.C.A. Hall, Castle Street,

Dumfries, on Wednesday and Thursday, April 9 and 10. The Joint Rock-garden Plant Committee will meet at the Show on Wednesday, April 9, and plants intended for the Committee's consideration should be entered with the Secretary of the Committee by 11 A.M.

Scottish Rhododendron Show—The Scottish Rhododendron Show will be held in the Music Hall, George Street, Edinburgh, on Tuesday, Wednesday and Thursday, April 22, 23 and 24. The Rhododendron and Camellia Committee will meet at the Show on Tuesday, April 22, to consider rhododendrons submitted for certificate. Rhododendrons intended for the Committee's consideration should be entered with the Secretary of the Committee between 10.30 A.M. and 11.30 A.M. that day.

Gardens open to the Public—The List of Gardens in England and Wales opening to the public under the National Gardens Scheme in 1958 may be obtained from The Organizing Secretary, National Gardens Scheme, 57 Lower Belgrave Street, London, S.W.1, price 2*s.* 0*d.*; by post 2*s.* 6*d.*

Code of Nomenclature—A new edition of the *International Code for the Nomenclature of Cultivated Plants*, formulated and adopted by the International Commission for the Nomenclature of Cultivated Plants, December 1957, has recently been published and is obtainable from the Society's Offices, price 2*s.* 6*d.*

Registered Daffodil Names—At the request of the Fourteenth International Horticultural Congress the Society has become the International Registration Authority for Daffodil Names, and in that capacity has published *The Classified List and International Register of Daffodil Names*. This book, which should be used by all who raise, name or exhibit daffodils, may be obtained from the Society's offices, price 6*s.*; by post 6*s.* 9*d.*

NOTES FROM WISLEY

Now that spring has arrived visitors will find much to interest them in every part of the Gardens; for in addition to the collections of plants under glass, to which we have referred in these notes in recent months, some of the best trees and shrubs are now coming into flower, as are many of the small bulbous and herbaceous plants which abound in the wild garden and elsewhere.

Battleston Hill will be especially worth visiting for the rhododendrons due to flower now. It is still too early for the hardy hybrids in the trial beds on the left-hand side of the broad walk to the Hill, but if the weather be reasonably favourable there will be a succession of species. Many of these are to be found in the beds on the crest of the Hill, and an explanation of that planting scheme may be appreciated by some

Fellows. This great genus of seven hundred species of trees and shrubs has been divided, for convenience of study, into forty-three series, each a group of species which appear to be nearly related. The species of any particular series will be found planted together in a bed, and the labels indicate the names of the series as well as those of the species.

No other genus can offer so wide a range of fine garden plants, and the following list of April-flowering species will serve to illustrate its diversity. Among the deciduous species of the Azalea series, *R. albrechtii*, deep rose-red, *R. vaseyi*, pale pink, and *R. schlippenbachii*, pale to deep pink, are all plants of great charm with gracefully poised blooms. In the dwarf, evergreen Lapponicum series are *R. hippophaeoides*, with neat greyish green foliage and lavender or rosy lilac posies of flower, and *R. russatum*, notable for the glowing violet-blue of its blossom. As examples of the populous Triflorum series, *R. lutescens*, slender-twigged, narrow-leaved and primrose-flowered, and *R. oreotrephes*, neat in its glaucous leaves and mauve flowers. Vivid colour is the rule in the Neriiflorum series, examples of which are *R. beanianum* and *R. euchaites*, both scarlet. The blood-red bells of *R. thomsonii*, associated with roundish, blue-green leaves, make this the easiest of all to recognize; to the same series belong two excellent yellow-flowered species, *R. campylocarpum* and *R. caloxanthum*. Representatives of the Arboreum series flowering now are the type species *R. arboreum*, red or pink-flowered and capable of making a quite sizeable tree, and *R. niveum*, which has flowers of an unusual cool purple shade.

In recent years there has been an enormous increase in the popularity of camellias on both sides of the Atlantic, and this is reflected in the considerable extension of the Wisley collection. In the wild garden there are large bushes, planted perhaps sixty years ago, of some of the old varieties of *C. japonica*, including 'Althaeaflora' and 'Anemoniflora', which still flower quite freely. Most of the more recent planting has been on Battleston Hill, where the risk of injury by late frosts is less. The collection here comprises a large number of varieties of *C. japonica*, forms of *C. saluenensis*, and the hybrids between the two, known collectively as *C.* × *williamsii*. This name commemorates the late MR. J. C. WILLIAMS, by whom several successful crosses were made. To this group belong the semi-double 'Donation' and the single 'J. C. Williams', 'Mary Christian' and 'Francis Hanger', a very handsome white variety, as well as several others. All of these have more than fulfilled their early promise, for they are of free growth and flower profusely for several weeks each year from February onwards. Reference was made in the January notes to the development of a strip of land on the east side of the cherry field. A path running through this connects the rhododendron species beds with the new footbridge near the Portsmouth road, and this path is bordered with varieties of *C. japonica*.

Other objects of interest in this part of the Gardens will be *Magnolia salicifolia*, one of the earliest to flower, which usually covers itself with medium-sized, pure white blooms in advance of the leaves; *Acer rubrum*,

the North American Red Maple, which glows with innumerable minute blossoms clustered along its twigs; and *Pieris taiwanensis*, the Formosan representative of an important ericaceous genus of evergreens, valuable for their plentiful bunches of long-lasting white flowers.

The Japanese cherries planted rather more than ten years ago in the field south of Battleston Hill have made good progress and are an important spring feature. The central avenue of *Prunus yedoensis* will be at its best during this month. A number of the less common species of oak have lately been planted in different parts of this area; but a good many years must elapse before they effect a noticeable change in its appearance.

On Weather Hill the visitor should look for *Magnolia kobus* and cherries of many kinds, of which *Prunus conradinae* in its semi-double, blush-pink form, flowered with unusual freedom in February. There are many different crabs here, as well as in Seven Acres and Howard's Field, constituting an indispensable group of spring-flowering trees. Of the white-flowered kinds 'John Downie' is one of the most popular, and its yellow, scarlet-flushed fruits have long been used for jelly. 'Dartmouth' has late and large purplish-red apples with a plum-like bloom. 'Frettingham's Victoria' is a very old but scarce variety with round fruits colouring bright scarlet early in the autumn, but it seems to be susceptible to apple scab. The species *Malus baccata*, which carries its cherry-like clusters of crimson fruits long after leaf-fall, and 'Yellow Siberian' with equally persistent golden apples, are well worth planting. At the present time there are many pink and purple-flowered varieties to choose from. The old and well-tried 'Eleyi' and 'Lemoinei' at once come to mind, and another in the purple-leaved class to be noted is 'Wisley Crab', which holds its purplish-pink blossom in rather tighter bunches, and has larger fruits, than the other two. 'Magdeburgensis' is a vigorous and shapely tree bearing bold clusters of double rose-pink flowers, but no fruits of any consequence. There are several good pink ones among a group raised in Canada, and 'Simcoe' is one of these to which the Society's Award of Merit has been given both for its excellence as a flowering tree and for its value in fruit.

In the alpine house, which was dealt with rather fully last month, there will still be plenty of flowers. *Pulsatilla vernalis*, opening pearly blooms from purplish, silky buds, *Jeffersonia dubia*, with mauve-blue frail petals half concealed in the mass of bronze-tinted young leaves, and *Soldanella alpina*, with many little blue, fringed bells, are general favourites. Many of the saxifrages should still be in good condition, and there will be lewisias, androsaces and shortias.

Probably the most striking plants in the vicinity of the rock garden are *Lysichitum americanum*, which has bold, deep yellow arum-like inflorescences rising among the developing tufts of huge pale green leaves, and *L. camtschatcense*, in which the spathes are white and somewhat smaller. These are admirable plants for boggy places on the margins of ponds. Some other lovers of moisture here are *Peltiphyllum peltatum*,

a large, rhizomatous saxifrage with pink flowers produced in advance of the long-stalked peltate leaves; and *Primula rosea*, extremely valuable for its early splash of bright colour, which is not far removed from magenta. This plant has been used a good deal in the moister parts of the alpine meadow at Wisley, flowering at about the same period as the extensive carpets of *Narcissus bulbocodium*.

Wisley is indeed fortunate in being able to provide so well for the requirements of the last-named and also for *N. cyclamineus*, long naturalized in the wild garden. They both appreciate moisture and freedom from disturbance and given such conditions they will seed down and increase. *N. cyclamineus* is usually not more than five or six inches tall, although in conditions especially favourable to vigorous growth some will exceed a foot in height, with corresponding increase in the size of leaf and flower. Like many another plant this dainty daffodil is in no way improved by being overgrown. Before its last blooms fade the mossy beds in the wild garden are dappled with the flowers of *Anemone nemorosa* and *A. apennina* in white and blue tints. The blotched leaves of erythronium together with the pink and white flowers of *E. dens-canis* and *E. revolutum* and the yellow ones of *E. americanum* and *E. tuolumnense* now appear, in company with such small plants as *Scilla lilio-hyacinthus* and *Isopyrum thalictroides*.

The trial of narcissi will be at its best this month. The bulbs are planted in groups beside the path from the vinery to Seven Acres. Here are some of the best varieties for garden decoration. Long established in the wild garden, the pinetum and elsewhere, it is possible to find examples of varieties which were highly esteemed half a century ago, but are now considered of little account. *N. obvallaris*, the Tenby daffodil, with a small golden trumpet of beautiful proportions, still grows in the wild garden. In the azalea garden the white *incomparabilis* 'Lord Kitchener' grows where it has been without replanting for perhaps forty years, and in the pinetum drifts of 'Emperor' and its contemporaries annually produce masses of bloom.

GARDENING WITH ELECTRICITY

A. W. Gray

(*Lecture given on January* 21, 1958, H. V. TAYLOR, D.SC., V.M.H., *in the Chair*)

DESPITE the attractions of organized sport, of the theatre and cinema, of radio and particularly of television, the number of people actively interested in gardening is increasing by leaps and bounds. This is quite evident from the growing number of people who are members of gardening and horticultural societies and of those who subscribe to the gardening journals. The crowds flocking to Chelsea and Southport are not all there out of sheer curiosity!

It has been suggested that for many this increasing interest in gardening is a subconscious reaction against the present tendency of "watching" instead of "doing". For others, it may be a form of escapism from the stress and strain of earning a living or running a home in these days of high-pressure living; there is, too, the inescapable fact that with the modern tendency to large-scale organizations, an increasing number of men of quite senior position are no longer masters of what they do or how they do it. If only to a relative few, financial pressure will have dictated the necessity of cutting down, or even cutting out, paid help in the garden and of getting down to the job themselves. These are possible explanations, but could not the simple answer be that whereas in the past, gardening was synonymous with back-breaking toil and tedious chores, and therefore, something to be avoided wherever possible, now science is providing so many gardening aids which take most of the navvying and much of the tedium out of gardening, people are able to enjoy the deep satisfaction of "growing things"?

Whichever and whatever the reason, there is no doubt that the scientific aids have had, and are having, a tremendous influence in our gardens and in gardening, and among these aids, electricity must hold a high, if not indeed, a pre-eminent place. Most people today demand modern things and so the present-day gardener looks towards electricity to help in the garden as it does in the home, office and workshop, and in every phase of our everyday life, and he does not look in vain.

In the form of *Heat*, electricity provides automatically controlled temperature in frame and greenhouse, sterilization of soil and control of pests. As *Light*, it not only extends the gardening season by enabling the gardener to work in the greenhouse or potting shed during the dark evenings of winter and early spring, but it offers exciting possibilities as an aid to the growing of plants. As *Power*, it lightens the labour of keeping lawns and hedges in good trim and helps to take some of the backache out of cultivation, as well as making possible power spraying, watering and attractive water effects in the garden.

Electricity has the attribute that by automatic control, it can virtually deputize for you. It "thinks" in terms of temperature through the thermostat which, reacting to the slightest change in temperature, controls the heating and ventilating of the greenhouse. It "remembers" in terms of time, by the time-switch which carries out operations automatically day after day without effort on the part of the gardener and even without his presence. Through the selenium cell it will take action at changes of light value imperceptible to the human eye. In the most advanced application so far, electricity detects the moisture requirement of young plants and proceeds to meet it; a "robot" gardener, always on duty, efficient and effective, and only paid while actually working; economical to a degree.

HEATING

It is in the form of heat that electricity is best known and it is widely used for providing growing temperatures in frames and greenhouses. Soil-warming equipment provides the required root temperature and a wide range of air-heating equipment takes care of the air temperature under the automatic control of the thermostat, which gives the orders to the heaters doing the work.

It is now generally accepted that most plants the amateur grows under glass will thrive in an air temperature of 50° F. as long as a root temperature of 60° F. is provided, while many will grow quite happily, particularly during the poor light period of winter and early spring, at 45° F., again as along as the proper root temperature is maintained. The provision of two separate temperatures, one for the roots and the other for the head of the plant, gives the "warm toes and cool head" growing conditions which we know are the best for the majority of plants.

Supplying the root temperature by electrical soil warming will cost only a penny or two a day, while maintaining these relatively low air temperatures with electrical heating equipment is economic and comparable in cost with any other fuel.

Soil-warming equipment

These balanced growing conditions are made practicable by the development of electrical soil-warming equipment of which there are two types, one operating at low voltage and the other at mains voltage. The low-voltage equipment consists of a heating element of stout galvanized wire—although this can be obtained with a plastic coating as a protection against corrosion—energized from a transformer at low voltage, 6 to 30 volts, depending on the area to be warmed. The mains voltage cable consists of a heating wire enclosed in an insulating cover which provides electrical insulation, and is operated at full mains voltage—usually 240 volts.

In situations where digging or other cultivation is likely to be carried out, low-voltage equipment must always be used. When there is no likelihood of this, then the mains voltage cable, which is lower in

FIG. 41—*Gentiana acaulis* at

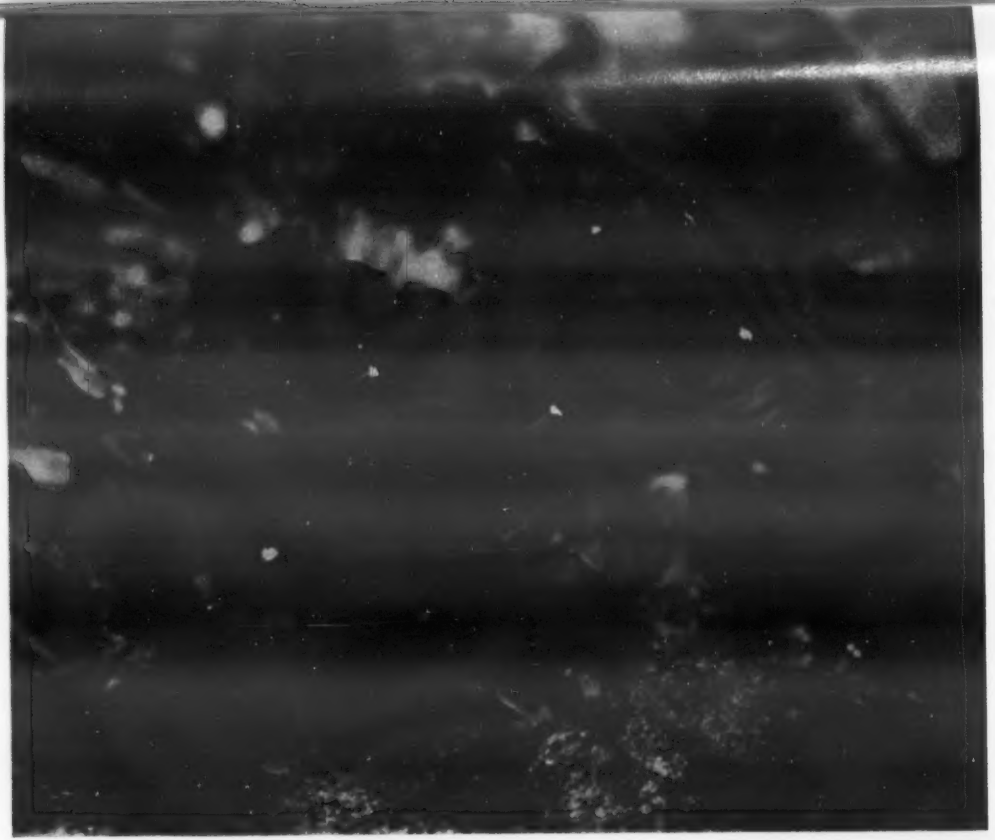


FIG. 41—*Gentiana acaulis* at the Waterperry Horticultural School (see p. 176)

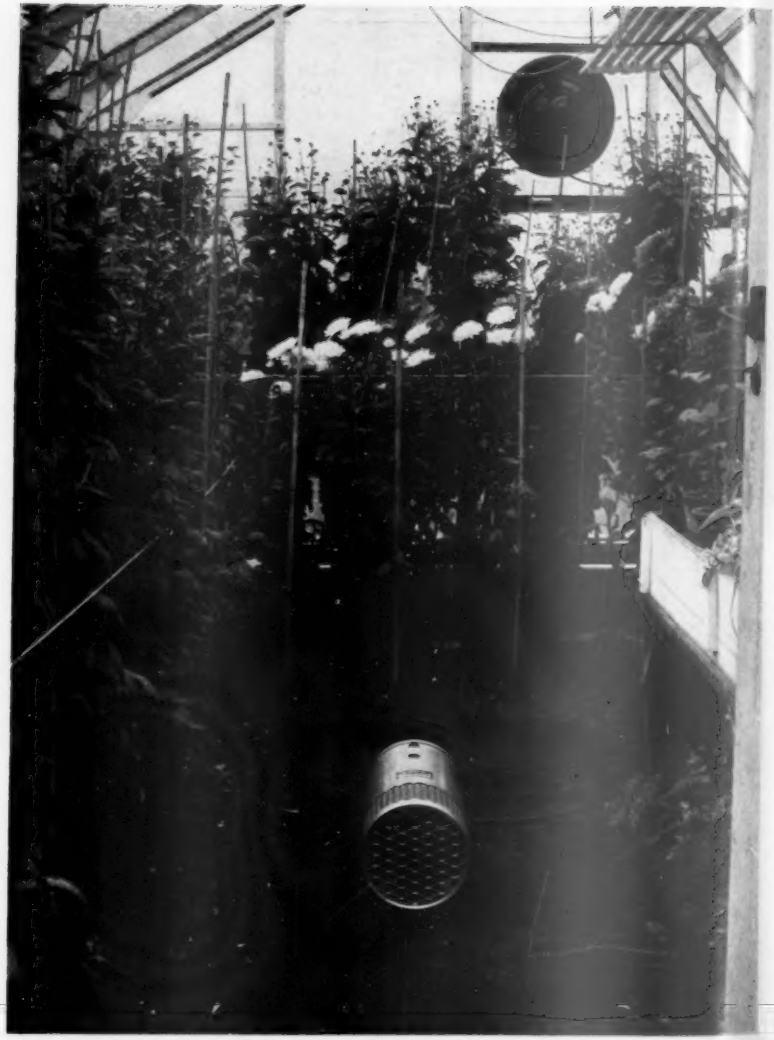
Photo, Valerie Finnis

Photo, J. E. Downward

FIG. 42—*Camellia japonica* 'Elegans' **F.C.C.** January 21, 1958. Exhibited by the Crown Estate Commissioners, The Great Park, Windsor (see p. 183)

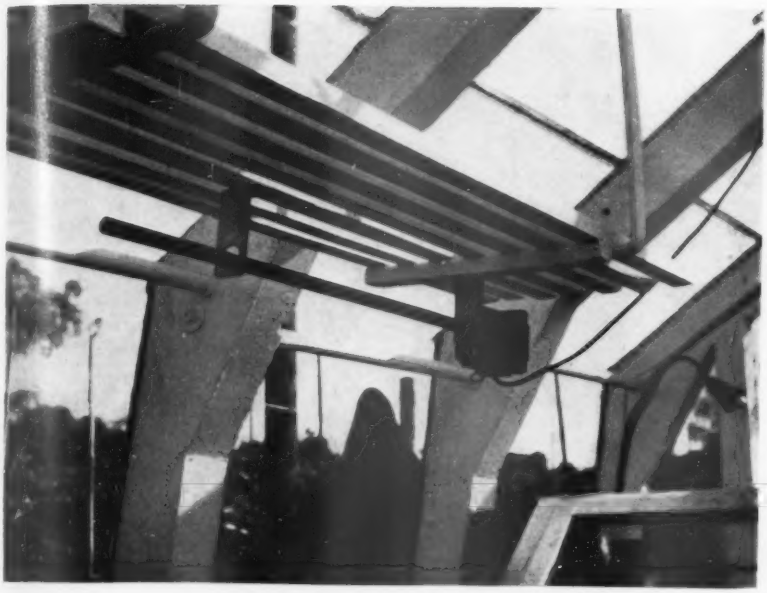
Photo, J. E. Downward

FIG. 43—*Hamamelis mollis* 'Pallida' **F.C.C.** January 21, 1958. Exhibited by the Crown Estate Commissioners, The Great Park, Windsor (see p. 183)



GARDENING WITH ELECTRICITY

FIG. 44—Fan unit heating and automatic ventilation of greenhouse
(see pp. 163 and 172)



GARDENING WITH ELECTRICITY

FIG. 45—Approved rod type thermostat for greenhouse heating control (see p. 164)

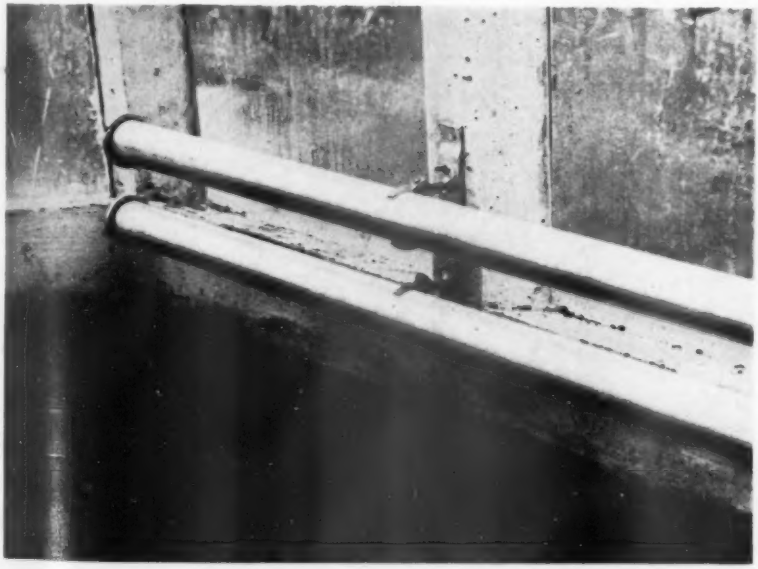


FIG. 46—Tubular heaters (horticultural type) for greenhouse heating (see p. 163)

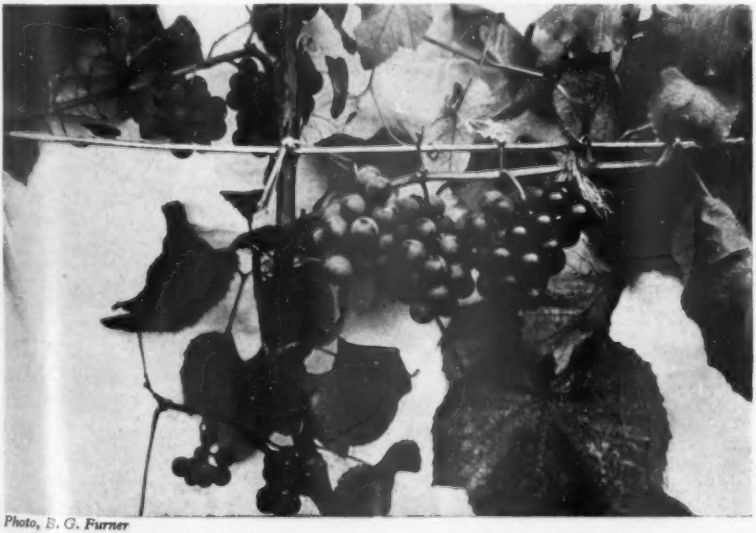
GARDENING WITH ELECTRICITY

FIG. 47—Installation of warming cables on open propagating bench (see p. 167)

FIG. 48—Heated frame with thermostatically controlled air warming cables and soil warming (see p. 166)

Photo, Arthur Cooper

FIG. 49—Fifteenth-century mural painting at Coventry Cathedral, showing tulips (see p. 181)



Photo, E. G. Furner

REPORT ON TRIALS OF LABRUSCAN GRAPES

FIG. 50—'Van Buren' grapes ripened outside in N.W. Kent (see p. 180)

FIG. 51—*Hamamelis japonica* 'Sulphurea' **A.M.** January 21, 1958. Exhibited by the Crown Estate Commissioners, The Great Park, Windsor (see p. 183)

first cost, is quite satisfactory. The emphasis on the use of low-voltage equipment where cultivation is likely to take place, is mostly on the grounds of safety, but also because the mains voltage cable is easily damaged by spade or fork and if damaged, must be replaced. This, in any case, gives rise to extra expense and labour, but should the damage occur once the crop is started, it means either scrapping the crop and replacing the cable, or letting the crop run on without the benefit of soil warming, a frustrating prospect in either case. Such damage to the robust wire element of the low-voltage equipment is unheard of and extremely unlikely. The low-voltage equipment should always be used for soil warming in beds and borders but either type of equipment is equally suitable for use in propagating frames and on propagating benches, but where the equipment is required for air warming, as will be described later, then the mains voltage cable is to be preferred.

Space-heating equipment

For the space heating, choice may be made from a wide range of equipment. Perhaps the best known and most widely used is the special horticultural tubular heater, made in aluminium to avoid corrosion, and watertight. These heaters are specially designed for greenhouse heating and this type only should be used. The heaters are loaded at 60 watts per foot-run of tube; they can be obtained in a wide range of lengths and so can be fitted into any shape or size of greenhouse, and to provide the maximum heat distribution, should be fitted around the walls of the greenhouse. Where more than one row of tubes is required, these should be mounted one above the other in the special brackets available, the bottom tube always being about 9 inches from ground or soil level (Fig. 46).

Rapidly gaining in popularity is the fan-unit heater in which the air is blown by a fan over a heating element, warmed and circulated around the greenhouse. Some models are designed for standing on the pathway and others for fixing to the structure of the greenhouse. With either type it is essential to see that the stream of warm air close to the heater does not blow directly on to the plants, as this will increase transpiration and interfere with the balanced growth of the plant (Fig. 44).

There is also available a wide range of heaters somewhat similar in design to the ordinary domestic fire. The heating element is usually confined to a small surface area, and the heat circulation is often local and restricted. As, however, these heaters are mostly of a low loading, usually more than one heater will be necessary to provide the required air temperature. Where this is so the heaters should be stood at equal intervals along the path to provide the maximum heat distribution.

An existing hot water system can readily be adapted to electrical heating by the fitting of immersion heaters into the hot water pipes. To provide the maximum circulation the heaters should be fitted into the lowest point of the pipework and, particularly where the boiler is free-standing outside the greenhouse, it is advisable to disconnect the boiler

and by means of a full pipe bend make the pipe system into a closed loop. Due to the thermal capacity of the water in the system, a system so converted will not provide such a closely controlled air temperature as will a fully electric system, but it has the attraction of comparatively low first costs. To the gardener who through the years has, in all kinds of weather, struggled, and often unsuccessfully, with an unpredictable solid fuel boiler, such a conversion will be a boon indeed.

There are also available electric heaters modelled on the hot water system and consisting of two upright cylinders joined by two pipes, the whole being filled with water which is heated by kettle-type immersion heaters fitted into one of the cylinders. When heaters of this type are used in soft water districts, or when filled with rain water, it is essential that those made of copper should be used, otherwise rapid deterioration due to corrosion will be experienced.

The type of equipment chosen will be a matter of personal preference and possibly of price, but despite claims which are often made, no one type of heater will prove more economical in running costs, nor provide more heat per unit of electricity than another. This is not to say that for a given installation one type of heater is not more suitable, it may well be, and obviously in such cases, this should be a guiding factor.

Control

The key to the economy and efficiency of electrical heating is in the automatic control. The soil warming, which is usually controlled by hand-switching, "off" and "on" never more than once each day, from observation of a thermometer placed in the growing medium, can equally well be controlled by thermostat or time-switch, but the control of the air heating *must* be automatic and by thermostat. For reasons of both accuracy and economy, it is essential that the correct type of thermostat should be used; a rod-type thermostat specially designed for greenhouse work, with waterproof head and with a rod not less than 20 inches in length, should always be used (Fig. 45). It will cost a little more than alternative and usually, unsuitable types, but will control the temperature to that required and so operate the heating at the maximum of economy. The thermostat should be mounted with the rod horizontal about one-third of the way in from the door, one-third of the way down from the apex to the ridge and not less than 12 inches from the glass. Shading of the rod from the direct rays of the sun may be worth while, but if a screen is used for this purpose, it must not be so far down on the thermostat as to prevent the free circulation of air around the rod, or the accuracy of the control will suffer.

Applications of electrical heating

A great advantage of electrical heating is its flexibility; the installation can be built up as one needs it and as one can afford it. When financial considerations do not have to enter into the scheme of things,

then a fully equipped installation is the immediate answer. The average gardener is not, however, in this fortunate position and so a gradual build-up will be the more usual progression.

First, the soil-warmed frame, then a frost protected-frame, followed by a heated frame with both soil warming and air heating. Next, a heated propagating case inside the unheated greenhouse and, finally, the heated greenhouse itself. It is not essential to have a greenhouse; in fact, the majority of plants required for the small garden can be raised quite well and very economically in quite a small frame equipped with soil warming and space heating. It will not, of course, provide the same comfortable working conditions for the gardener and there will be limitations regarding some crops, and so the fully electrified greenhouse will be the ultimate aim of most gardeners. In any case, this progression is a good one to adopt, particularly for the gardener with no previous experience of raising plants with heat. None of the expenditure will be wasted because, as every gardener who has a heated greenhouse will have found, frames in which to harden off plants and to take the overflow from the benches in the greenhouse are a necessity.

The soil-warmed frame

For the gardener who only wants to grow early salad crops, bring on some of the less hardy vegetables and perhaps, seedlings of lettuce, brassicas, etc., for later planting out in the garden, the soil-warmed frame is the answer. In such a frame where cultivation will take place, low-voltage equipment must be used. The warming wires are laid direct in the soil at a depth of 6 to 8 inches, evenly spaced to give a uniform loading of about 6 watts per square foot, the transformer standing in the corner of the frame on top of the soil. Crops for growing-on are planted direct into the soil and seedlings for pricking out later on can be raised from seed directly sown. When, however, it is required to raise plants in pots or boxes, the pots should be plunged into the soil while for the boxes about 4 inches of the soil should be removed so that the base of the box is nearer to the warming wire.

Control is by the "dosage" method and can be either by hand switching or by time-switch. In the warmer parts of the country, a running time of 10 hours each night will be sufficient to provide a good soil temperature; but in colder parts, 12 or even 14 hours warming should be used. Usually the wiring to the frame will be from the house installation, in which case a switch should be provided at a convenient point in the house so that the switching can be done more easily without the necessity of toiling down the garden night and morning.

A popular use for a soil-warmed frame is the raising of early salad crops. 'Gotte à forcer', or 'Cheshunt 5B' lettuce seedlings raised cold and planted into the frame at Christmas time will give an excellent crop for cutting in mid-March, while if the lettuce seedlings are undersown with 'Amsterdam Forcing' carrot seed at the time of planting, a very welcome crop of early carrots will be gathered in early May.

The frost-protected frame

A frame which is frost free is a boon in any garden, whether used for over-wintering the less hardy outdoor plants such as geraniums, fuchsias, etc., carrying over a few cherished pot plants, or used as a safe depository for hardening-off plants from the greenhouse. Any sound frame can be so protected with little effort, little initial expense and low running costs. A temperature rise of 20° F. in the frame will deal with all but the extremes of outside temperature and a mains voltage warming cable fixed around the walls of the frame on suitable insulators and controlled by a rod-type thermostat is an easy solution. The loading to give a 20° F. temperature rise should be calculated at 12 watts per square foot of glass, and a frame made up of two Dutch lights and having an area of 25 square feet of glass would require $25 \times 12 = 300$ watts loading. Consumption of electricity would be modest, in the milder parts of the country averaging about 100 units of electricity per annum, while in the very cold parts, not more than 130 units would be used.

The heated frame

For the gardener who has to rely on his frames for providing a range of plants for his garden, something more than frost protection is required and a frame in which the required root and air temperatures for active growing are provided electrically, is the obvious solution. For soil warming, at 6 watts per square foot, either low-voltage or mains voltage equipment can be used; the warming element or cable is laid evenly over the bed of the frame and covered by 3 inches of clayey sand which warms up to provide a warm bed on which to stand pots or boxes, or in which to root cuttings. Pots should be plunged into peat placed on the bed with the base of the pot resting on the warm sand, boxes are placed directly on the sand, and for cuttings the rooting medium to a depth of about 4 inches should also be placed on the sand bed (Fig. 48).

The air heating, thermostatically controlled, is similar to that for the frost-protected frame, i.e.: a mains voltage cable fixed around the walls of the frame on suitable insulators, but a higher loading, at least sufficient to give a temperature lift of 25° F., should be installed. This will ensure an air temperature of 45° F. inside the frame, even when the outside temperature falls as low as 20° F. Calculate the loading for the heating cable at 3 watts per square foot of glass for each 5° F. temperature rise required. Thus, for a temperature lift of 25° F. in a $5' \times 5'$ frame, $25 \times 5 \times 3 = 375$ watts loading would be required, while for a 30° F. lift, $25 \times 6 \times 3 = 450$ watts would be necessary.

The consumption of electricity for the air heating will depend on the temperature maintained in the frame, but for a $5' \times 5'$ frame with an air temperature of 45° F., it would average about 250 units per annum in the South of the country, and 350 units for the colder North. For a temperature of 50° F. the consumption would be about 480 and

650 units respectively. The soil warming, which should be hand-switched, from observation of a thermometer plunged into the sand bed, to provide a root temperature of 60° F., will average about 18 hours per day running, and this would consume about 2½ units per day.

The open warmed bench

A warmed bench on which to stand pots and boxes and in which to root cuttings, is an asset in any greenhouse. A bed of sand in which are placed warming wires or cables at a loading of about 7½ watts per square foot is an economical way of providing root temperature in an unheated or heated greenhouse. Side boards are fixed around the bench to form a trough about 6 inches deep, 3 inches of sand are placed on the bench and on this is laid the warming wire at a loading of about 7½ watts per square foot; this is covered by a further 3 inches of sand. Control, to provide a root temperature of 60° F., is usually by hand-switching, but can be automatic by thermostat (Fig. 47).

With a warmed bench to provide the required root temperature, active growing can be started much earlier in the year in an unheated greenhouse than would be the case where the gardener has to rely on ambient temperatures only, while in a heated house, the provision of a warmed bench is essential if the space heating is to be run at an economically lower temperature.

The enclosed propagating case

A first step towards providing a growing temperature for the early germination of seeds, rooting of cuttings or for bringing on seedlings in an unheated greenhouse, irrespective of the ambient temperature, can be by means of an enclosed propagating case equipped with soil warming and air heating similar to the heated frame. Loadings should be worked out as for the heated frame but due to the added protection of the greenhouse, running costs will be about 20 per cent less. It is an advantage to design the case so that the glass rises to a ridge, forming a miniature greenhouse within the greenhouse, thus giving more headroom than is usually provided by the standard propagating case.

In a heated greenhouse a similar case will afford more exotic environment for the propagating and growing of plants requiring warmer conditions—or climates—than could be economically afforded in the parent house. The parent house is generally kept at some modest temperature of from 45° F. to 50° F., while temperatures of 65° F. or 70° F. are economically provided in the case. Several such cases might well be installed to provide a range of climates within the one-containing house.

THE HEATED GREENHOUSE

It is in the provision of thermostatically controlled space heating in the greenhouse that electricity makes its greatest appeal to gardeners. It is

clean, it can be entirely automatic in operation and, if properly designed and efficiently managed, an electrical space-heating installation is comparable in installation and running costs with any alternative system.

Not all installations have lived up to these expectations, but usually the reason is not difficult to find. Most of the disappointing results from electrical space-heating in the greenhouse are due to a failure to provide sufficient loading to maintain the required temperature during spells of severe weather. Such underloading is often the result of ignorance of the actual loading required, but some manufacturers of electrical space-heating equipment must bear the responsibility for many of the unsatisfactory installations through making claims for their equipment which cannot be substantiated. The claim that a particular heater will provide a temperature of so many degrees in a greenhouse of a certain size without specifying against what outside temperature, and often when the heater will only give a temperature rise of some 6° F. or 8° F., is not only meaningless, it is misleading and must be condemned.

Electrical loading

Calculating the correct electrical loading for a heating installation is straightforward, requiring only a few measurements and some simple arithmetic. The calculation is based on the heat loss from the greenhouse, through the structure—glass, wood, brick, etc.—into the outside air, into the subsoil and by ventilation. The thermal conductivity—or heat transfer rate—of the materials commonly used in greenhouse construction is known and is given in Table I in British thermal units of heat (B.t.u.) per square foot, per hour, per 1° F.

From this table can be calculated the heat loss from the greenhouse in B.t.u. per hour for 1° F. difference between the inside and outside temperatures, and this is the first step towards working out the loading required. The next step is to find out what electrical loading is required to offset this loss. Fortunately it is known that one watt of electricity burning for one hour produces 3·412 B.t.u. and so if we divide the heat loss by 3·412, we arrive at the loading required to raise the temperature in the greenhouse 1° F. over the outside temperature.

To complete the calculation one further figure, that of the "temperature lift", is required. The "temperature lift" is the difference between the temperature required to be maintained in the greenhouse and the outside temperature against which it has to be maintained. To guard against the lowest outside temperature ever likely to be experienced, would need a very heavy loading and would be expensive to install. Experience has shown, however, that it is realistic to guard against an outside temperature of 20° F. and this is the "datum line" from which most installations are planned. Thus, if a temperature of 45° F. is required in the greenhouse, then the "temperature lift" will be 45° F. − 20° F. = 25° F.

The calculation of the loading of the heating installation is, therefore, as follows:

1. Measure the surface areas of the glass, brickwork, soil, etc., of the greenhouse, and multiply each by the appropriate factor from Table I. To these totals add 33⅓ per cent to cover fortuitous losses and ventilation, and this will give the heat loss from the greenhouse in B.t.u. per hour for 1° F. difference between inside and outside temperature. For the sake of simplicity the glazing bars are included with the glass area.

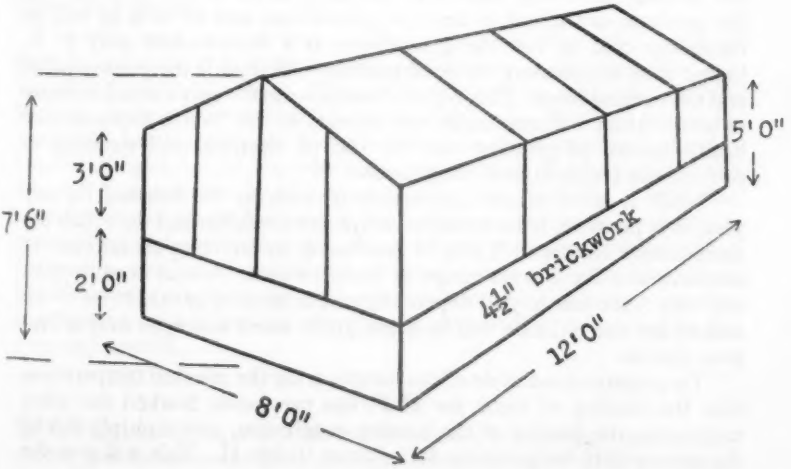
2. Divide the total heat loss by 3·412 and this will give the loading in watts required to offset the heat loss and raise the temperature in the greenhouse by 1° F. over the outside temperature.

3. Multiply the watts per 1° F. temperature rise by the "temperature lift" and the result will be the total loading of the heating installation necessary to maintain the required temperature in the greenhouse against 20° F. outside.

Just how this works out will be seen from the following example:

Example

Greenhouse 12 feet long×8 feet wide, dimensions and constructional details as shown in sketch, location Kew, heating requirement to maintain an inside temperature of 45° F. against 20° F. outside.



Loading

Fabric	*Area (sq. feet)*	*Thermal factor (Table I)*	*Heat loss (B.t.u./hr./°F.*
Glass	254	×1·0 =	254
Brickwork	80	×0·6 =	48
Floor	96	×0·33 =	32
		Heat loss/°F./hr. =	334
		Plus ⅓ for fortuitous losses =	111
		Total heat loss/°F./hr. =	445 B.t.u.

$$\frac{445}{3{\cdot}412} = 130 \text{ watts/°F. temperature rise}$$

Temperature lift = 45° F. − 20° F. = 25° F.

∴ loading required = 130 watts × 25 = 3,250 watts, *or* 3·25 kilowatts.

Estimate of consumption

The temperature at which the greenhouse is to be run is of considerable importance because not only does this decide the loading of the heating installation, but it also has a decisive effect on the consumption of electricity and so, on the running costs. These are a recurring charge and in many cases may well be the deciding factor as to whether or not the gardener can afford to heat the greenhouse and so it is as well to remember that to run the greenhouse at a temperature only 5° F. higher than is necessary for good growing will double the consumption and the heating costs. This big increase in costs for only a small increase in temperature will emphasize the benefits of the "warm toes and cool head" system of growing and the use of electrical soil-warming to provide the required root temperature.

While it is, of course, impossible to forecast the weather for any year, it is possible, from statistics which are available and on which the temperature factors in Table II are based, to arrive at an estimate of consumption for a wide range of temperatures. Actual consumption will vary from year to year depending on the severity or otherwise of the season but the estimate will be a fair guide when averaged over a five-year period.

To prepare an estimate of consumption for the selected temperature, take the loading of *watts per 1° F. rise* previously worked out when calculating the loading of the heating installation, and multiply this by the appropriate temperature factor from Table II. This will give the

estimated annual consumption of electricity at that temperature during an average year.

In the following example, based on the 12 feet×8 feet greenhouse, when the *watts per* 1° *F. rise* is 130 watts, estimates for a range of temperatures are given.

Temperature required (°*F.*)	*Watts*/°*F. rise*	*Temperature factor* (*Table II*)	*Estimated annual consumption* (*kWh*)
45° F.	130	×15·3 =	1989 kWh
50° F.	130	×29·9 =	3887 kWh
55° F.	130	×50·5 =	6565 kWh

Soil sterilizing

For sterilizing loam for seed and potting composts, electrical equipment provides the gardener with a really practical and effective method. Heat, from metal plates containing heating elements and fixed into an outer container, passes by conduction into the soil. Raised to a temperature of 180° F. in about 1¼ hours for the expenditure of some 4 units of electricity per cwt., the soil is freed from pests and disease and annual weed seeds are killed.

While possibly the initial costs will limit the number of gardeners who can afford sole ownership, such equipment might well be considered for joint ownership by a number of gardening neighbours.

Greenhouse hygiene

Usually used as a remedy, instead of a protection, the round of smokes and sprays to combat pests and disease in the greenhouse is something which the busy gardener could well be without and it is another chore which electrical heat can take over. A thermostatically controlled heating element in the bottom of a small container liquefies insecticides and fungicides, which are continuously discharged into the air of the greenhouse in the form of very fine particles. These fine particles in the air and covering the surface of plants and structure, give instant and continuing protection against not only troubles within the greenhouse, but also deal with airborne spores and pests brought in by ventilation. As far as the gardener is concerned, this tedious routine is reduced to the occasional changing of the medium according to the crop and season.

LIGHT

In his Masters' Memorial Lecture given on May 3, 1955, and subsequently published in the October and November issues of the JOURNAL,

PROF. R. H. STOUGHTON showed just how complete and complex is the controlling influence of light on plant growth. The whys and wherefores of this control are beyond most of us and yet "what it does" offers exciting possibilities for the adventurous gardener.

PROF. STOUGHTON gave details of what can be done to increase the growth rate of plants by high intensity artificial light, used as a supplement to natural daylight during the winter months, and described the effect on the flowering of chrysanthemums of increasing the day length with low intensity light. The growing of plants by artificial light only, however, offers equal opportunities for horticultural adventure. The forcing of bulb flowers in insulated buildings heated electrically and where the light is provided by tungsten lamps, is widely practised by commercial growers, while the ordinary gardener can utilize cellars, sheds or even, cupboards with equal effect. We are only on the fringe of this new and exciting development and there is endless scope for trials and experiments. A more mundane use for electric lighting, one widely used by the wise gardener, is for providing working light in potting shed, greenhouse and yard, extending the gardening day and season. Lighting need not and should not stop there, however; most gardens have some item of interest, whether it be bed or border, or a single tree, perhaps, which would provide an ideal subject for "flood lighting". With quite simple treatment, outstanding items, or even well-known and often overlooked features, will take on a new interest and beauty.

POWER

In the electric motor lies electricity's answer to strained muscles and creaking joints, to the toll of advancing years and physical disabilities.

Power tools

Lawn mowing and all that goes with it, hedge trimming, cultivation and hoeing, all these time- and energy-consuming operations are lightened and speeded up by equipment powered by the electric motor.

Ventilation

For the gardener with a greenhouse, perhaps the greatest boon is the automation of ventilation. An electrically-driven extractor fan is the full answer to the vexed question of when and how much to ventilate. Controlled by a rod-type thermostat, the fan will provide all the air changes necessary to keep the air buoyant and the plants in good heart, and this, without any opening of ventilators or doors. Pulling in air through the overlaps of the glass and from around the door, a fan of suitable size will provide up to thirty-five air changes an hour, something which it is often impossible to approach by traditional ventilation. Given the right type and size of fan, one more source of family friction can be relegated to the past (Fig. 44).

Watering

For the fortunate gardener who has available an adequate supply of water, other than from the mains, an electric pump will provide pressure for watering, spray lines and decorative water features under fully automatic control, at a cost of much less than for similar facilities from the mains, and without the frustrating restrictions which so often bedevil the use of a mains water supply in the garden. Fully automatic watering is not yet an accomplished fact but electricity has made possible a recent development which goes a long way towards it and may yet provide the final solution.

Mist propagation

In a lecture to this Society in July 1957, subsequently published in the November 1957 issue of the JOURNAL, three authors dealt very fully with the new technique of rooting cuttings under a regulated mist of water and in full sunlight. Automatic control of the mist is by an "artificial leaf" which is placed among the cuttings on the propagating bench, receiving sun and mist in similar proportion to the cuttings and losing moisture from its surface by evaporation at the same rate as from the cuttings.

In the top of the "artificial leaf" are two electrodes or contacts between which, when joined by a film of water, a minute current of electricity flows, keeping closed a magnetic valve which controls the water supply to the misting nozzles. As the water film is broken by evaporation of the water, the current ceases to flow and the magnetic valve opens and allows mist to fall on the cuttings and the "artificial leaf" until the film of water is restored, when the magnetic valve recloses. The whole cycle of control is completely electrically automatic in operation.

Early experience showed the necessity of providing good bottom heat if maximum results were to be obtained and in most installations, a bottom temperature of between 75° F. and 90° F. is provided by electrical soil-warming equipment. Difficulty was also experienced in weaning the rooted cuttings from the humid conditions under mist to normal growing and watering conditions. This too, has been taken care of electrically, an electrically operated controller is now available which gradually reduces the frequency of the mist falling on the rooted cutting until finally it is weaned from the mist conditions and normal watering can be started without check to the plant.

For the proper atomization of the spray a high and constant water pressure is essential and when these conditions do not apply, an electric pump will make good the deficiencies. Due to the cost of the equipment, the mist propagating technique is at present largely confined to commercial growing but no doubt as the demand increases and manufacturing techniques are improved, the cost will come down and mist propagation find a place in many gardens.

INSTALLATION

It would not be proper to finish any story of electricity in the garden without reference to the electrical installations, the wiring, the control gear, the mains to the greenhouse or frames and the connecting up of the apparatus or equipment. The reference should be brief and properly be confined to advice, on the following lines:

The installation of electricity is not a job for the amateur or handyman electrician, and this is particularly true in the garden; it must be carried out by a competent electrician.

Proper planning of the installation is essential and should include not only immediate but also future requirements. Get the best advice you can in the early stages, go to your local Electricity Board or to a contractor with experience of the work, talk over your requirements and be guided by them, but go armed with a knowledge of the equipment available and if a heating installation is contemplated, the loading necessary to provide the temperature you require.

A final word of advice—once the installation is completed and working, leave all the worrying to electricity and get on with enjoying your gardening.

TABLE I

Thermal factors of materials

Material	*Thermal conductivity (B.t.u./sq. feet/hr./°F. diff.)*
Horticultural glass	1·0
Corrugated asbestos	1·3
Sheet asbestos	1·0
Wood, 1-inch	0·5
1½-inch	0·4
Brickwork, 4½-inch	0·6
9-inch	0·5
13½-inch	0·4
Concrete, 4-inch	0·6
6-inch	0·5
Floor concrete	0·33
Floor soil	0·33

TABLE II

Estimate of consumption

Temperature °F.	*Multiplication factor*
35	1·9
40	6·5
45	15·3
50	29·9
55	50·5
60	75·4
65	105·2
70	138·1

These multiplication factors are based on conditions at Kew over a five-year period. For other parts of the country, the estimate of consumption can be obtained by multiplying by the following correction factors :

Locality	*Correction factor*
S.W. England–I.O.W.	0·85
Midland belt	1·10
N. England and mid Scotland	1·25
N. Scotland	1·33

GENTIANA ACAULIS

Valerie Finnis

GENTIANA acaulis has been cultivated in this country for over a century and is one of our best-loved rock garden plants. It is doubtful whether any other plant has ever created such widespread controversy. In some gardens it will flower freely each year, whilst in a neighbouring garden, in the same soil and situation, not a single flower appears despite every possible inducement. In a vain search for the reason for

its irregular behaviour countless reports and experiences have been investigated and exhaustive experiments carried out, but the mystery remains unsolved. To suggest any solution to this age-old problem is treading on very dangerous ground. However, the advice of some experts is to tread on *G. acaulis* as being the only way to encourage flower production.

Last spring our plants at Waterperry Horticultural School, near Oxford, flowered magnificently (Fig. 41). Many asked, "What have you done to make your *acaulis* flower?" The honest answer is we had done nothing. It so happened that the preceding winter was unusually mild and this could have influenced the flowering, for in this country the flower-buds may be damaged by hard frosts. Abroad, in their natural habitats where they appear to flower profusely, there is a protective blanket of snow in winter.

Some experts are convinced that the soil is more important in the flowering of *G. acaulis* than climatic conditions. Experiments have been carefully carried out at the Edinburgh Botanic Gardens. Twenty-four good plants were potted up into 12-inch pots containing a similar soil mixture. Twelve spent their first year nine miles outside the city (at Rosslyn), where they flowered freely, whilst those in Edinburgh refused to flower. The next year the plants were exchanged—those brought back to the botanic gardens never flowered and once again those at Rosslyn produced a glorious display. The experiment was repeated for several years with the same results every time—were atmospheric conditions responsible?

Possibly rainfall is the one factor concerned. In many gardens the greatest care is taken to water the plants regularly during a dry season to ensure a prolific crop of blooms the following spring. Believing this to be a necessity in their successful cultivation, it is somewhat disturbing to recall a plant (never artificially watered) growing in the driest bed of poor soil at the foot of a south wall at Waterperry that produced thirty-one exquisite flowers!

How can those convinced that the answer lies in the soil explain the fact that *G. acaulis* has been known to flower in practically all types of soil and even in soil-less culture. It is equally true to say that plants often fail to flower in widely differing soils. Is there some form of soil bacteria or mycorrhiza influencing the flowering habits?

Choosing an open sunny position, June is the best time to plant *G. acaulis*. Old congested clumps that are past their prime are best divided into small plants consisting of three or four shoots. Dividing the whole stock at one time should be avoided because *G. acaulis* often does not settle down and flower well until a few years after planting; a disturbance may upset the plant's annual cycle and delay flower production. But their behaviour is unpredictable, for in some gardens division is practised in June every year and practically every little plant blooms the next spring. Plants propagated by seed invariably flower well quite early in life.

Few dispute the need for firm planting. The "stamping with hobnail boot" method is practised with good results or planting firmly along the edge of a path to receive a more gentle trampling.

In a garden where the beds of *G. acaulis* are famous for their glorious annual display, a top dressing of loam and bonemeal is applied after flowering, nearly covering up the leaves. In this instance feeding appears to be most important. On the other hand luxuriant clumps may never produce one flower.

It is credible that the roots enjoy the company of others; after all, gentians in their natural habitat are in close association with all kinds of plants. We may be too fond of hoeing and weeding; to neglect this may be a solution.

Countless seeds and plants of gentian have been brought into this country under the name "acaulis" and there are obviously free- and shy-flowering strains. Those who cannot flower the plant might well collect a free-flowering form abroad, growing in a similar soil to their own, and try their luck!

Most of these are undoubtedly forms or closely allied species, but there is great confusion amongst the group and the "acaulis" of gardens varies tremendously.

The name "acaulis" has been the subject of much confusion in the past and as used by LINNAEUS covered at least two species and so has been set aside by many botanists as ambiguous. The plant usually cultivated in gardens is probably nearest to *G. excisa* Presl. and is distinct from *G. kochiana*.

G. acaulis alba, if a good pure white form, is very lovely; free-flowering strains can be successfully propagated by cuttings.

G. alpina is a small edition of *G. acaulis* definitely requiring a lime-free soil.

G. angustifolia is far less shy-flowering than other members of the group and is not fussy about soil. Cultivar 'Leith Vale' is outstandingly good and comparatively easy to grow.

G. dinarica is not temperamental and is a lime-lover of great charm. *G. clusii* (syn. *acaulis vulgaris*) is a large-flowered species enjoying lime in the soil. *G. kochiana* (syn. *grandiflora*, *latifolia*, *vulgaris*) is said to be a plant of non-calcareous soils, but in one chalky Berkshire garden it is a mass of flowers in June and July and rarely without a flower or two right into the autumn. It is interesting to note a group of *G. acaulis*, 1 yard distant, occasionally produces a meagre crop of flowers.

Perhaps a vitamin or atomic energy tablet tucked in by the plants will prove to be the answer! But if all our gentians flowered every year we should be at a loss without the great challenge *G. acaulis* offers to all those who persistently endeavour to conquer its idiosyncrasies.

PLANTS AND PROBLEMS—XLII

WHITE WORMS IN COMPOST HEAP

Question. I am sending you a sample of soil from my compost heap containing large numbers of small white worms which vary from ½–1 inch in length. A friend has seen the same kind of creature around the roots of potted greenhouse plants and thinks they may be eelworms. Could you verify this and let me know how I can get rid of them.

Answer. These worms are often sent to us in mistake for eelworms. They are, however, much too large for this to be the case. Eelworms are all extremely small, most of them being only visible by means of a microscope.

The worms you have sent belong to the family Enchytraeidae, and are commonly called Pot worms, Aster worms, or Putrid worms. They are commonly found among rotting vegetation, manure, and the like. They are also found around the roots of pot plants and in the past have been blamed for damaging and even killing them. The evidence for and against this charge has been very contradictory, but it is now generally assumed that they are not harmful. Where they are found among damaged roots it is more likely that they have been attracted there by rotting plant tissues which are the result of the activities of some other pest. It also appears unlikely that they enlarge the original damage, but confine their feeding to rotten tissues only.

You may therefore use the compost in your garden with perfect safety without treatment.

FRUIT TREES—MULCHING AND WATERING

Question. Having planted several new fruit trees during the winter, are there any special precautions that should be taken now to ensure that they grow successfully?

Answer. The most important thing to watch is soil moisture. Dryness at the roots just as newly-planted trees are starting to grow will have adverse effects—trees may remain stunted or even die, particularly on the poorer sandy soils. To guard against this apply immediately a mulch of well-rotted farmyard manure, compost, peat or any similar material. Put this on, following rain if possible, and spread it to give at least a 3-inch covering but keep the mulch clear of the stem. In addition to mulching examine the soil occasionally to a depth of a foot or more, and at the first sign of dryness give a good watering. Merely damping the soil will do more harm than good and several gallons per tree at least will be necessary. Such watering should be repeated as often as required

and in dry weather an occasional spray of tepid water on the foliage will also help.

There have been spring droughts in the last four successive years so that mulching and watering at this particular time are a good insurance against the loss of young trees.

REPORT ON TRIALS OF LABRUSCAN GRAPES

B. G. Furner

IT is a sad sight to see unpruned and unwanted Black Hamburgh vines trailing over chicken runs and garden walls in this area (N.W. Kent). Each autumn the vines are covered with bunches of unripe and mildew-covered grapes. Some gardeners have tried to ripen the grapes by fitting polythene bags over a few bunches. Unfortunately, this idea was of no use.

After reading (in their books on the subject) of the excellent results of MR. EDWARD HYAMS and MR. R. BARRINGTON-BROCK with many European (*Vitis vinifera*) and hybrid vines, I attempted to emulate them.

Apparently I was unlucky in my choice of variety. I purchased a two-year-old vine of 'Chasselas Vibert'. After three years, the vine produced seven grapes. I have recently learnt from MR. L. P. MEW, an Isle of Wight vigneron, that his 'Golden Chasselas' vine, like my 'Vibert', did not take kindly to Guyot pruning (advised by HYAMS and BARRINGTON-BROCK for outdoor vines), but that it fruits well as a wall vine. I am, therefore, allowing my 'Chasselas Vibert' to grow in that manner.

Whilst studying HYAMS and BARRINGTON-BROCK I contacted my uncle, MR. D. FURNER, a fruit-grower in Naramata, B.C. A glance at the atlas will show that the southern part of British Columbia and Kent are roughly on the same latitude (51° N.). My uncle reported on his good results with vines purchased locally.

To me it seemed very possible for the same varieties which ripen high up in the mountains of British Columbia to ripen at sea-level on the Thames marshes.

I wrote to PROFESSOR BARSS of the University of British Columbia at Vancouver. In the opinion of PROFESSOR BARSS a trial of early-ripening Canadian varieties would be worth while. In early 1954 I received cuttings of the Labruscan varieties 'Seneca', 'Fredonia', 'Ontario' and 'Van Buren', from the Horticultural Experiment Station, Vineland, Ontario.

The spring and early summer of 1954 were dry. I have no water available and I, therefore, lost many cuttings which failed to root.

In the late autumn of 1954 and again in the autumn of 1955, the young vines were pruned in the Guyot manner. Some of the vines were moved to leave them a yard apart in rows 4 feet apart. During the autumn of 1956 a few berries ripened. Fellows will remember that the summer of 1956 was almost sunless.

In December 1956 I sent my first report on the trials to the Vineland Station. In his reply, MR. A. O. BRADT (Research Scientist), informed me that Guyot pruning is quite wrong for Labruscan varieties, that my close planting was also wrong and he kindly sent me an Ontario Government publication he had written, which advises Canadian vine-growers on the planting, training and pruning of vines grown in Canada. After studying this handbook, I was forced to transplant most of the vines and only three were left in their original positions.

The summer of 1957 was also not ideal for grape ripening. In France the crop is reported as poor and it is very possible that France will be importing wines from Italy by the spring. It was, therefore, a very pleasant surprise to find grapes on the vines, ripe and ready for picking on September 8. At Vineland, only 'Van Buren' ripens as early as the first week of September. Over there, 'Seneca' and 'Fredonia' ripen towards the end of September. I was, therefore, delighted that Kent had "beaten" Ontario for early ripening of 'Fredonia' and 'Seneca'. I am now hoping for a summer like that of 1955. Will these grapes ripen in August in a hot English summer?

The grapes of 'Van Buren' and of 'Fredonia' are black. 'Seneca' is a white grape. The cuttings of 'Ontario' were all apparently lost during the drought of 1954. The bunches were quite small, although I believe that is quite normal on a young vine. No thinning of the bunches appears necessary. The grapes themselves are larger than outdoor Brandt grapes. 'Van Buren' (Fig. 50) and 'Fredonia' grapes are almost round. 'Seneca' grapes are similar in shape to dessert grapes from Almeria.

Labruscan varieties are reputed to have a "foxy" flavour. This flavour is described by polite people as "strawberry". For this reason French raisers of twentieth-century hybrids eschew *Vitis labrusca* varieties. If the native wild Labrusca grape is similar in flavour to the so-called "Strawberry Grape" (grown in Britain) then I can well understand why English colonists in Virginia never attempted to cultivate wild Labruscas in their settlements. They preferred failures (due to *Phylloxera*) with their imported *Vitis vinifera* varieties from France.

Some of this "foxiness" has apparently been bred out of current Labrusca vineyard varieties. 'Concord', one of the best known of the Labruscas is used by millions of Americans for home wine-making. The varieties I have certainly do not produce grapes which can be described as "foxy". From the way my friends ate their samples, I am led to believe that they suit the British palate as well as they suit the palates of our friends and relatives in Canada and the States. 'Van Buren', 'Fredonia' and 'Seneca' are table grapes. That does not

mean that they are unsuitable for home wine-making. After all, even 'Concord' is described as a "table grape" and is used by home wine-makers. Owing to my small crop with these young vines so far, I have had to mix the grapes with those from a 'Brandt' vine.

The vines have not been sprayed or dusted. Orange-brown markings appeared on the leaves of a 'Fredonia' vine in 1956 and in 1957. According to MR. BRADT this may be Downy Mildew. A 'Chasselas Vibert' vine a few feet away was not affected. If the trouble occurs next year I will have the leaves examined. As my great trouble is summer drought, the vines are mulched annually with garden compost.

TRAINING AND PRUNING

I have adopted the six-cane Kniffin system. This consists of a stout trunk with six strong laterals. The laterals are pruned back each autumn.

SUMMARY

According to MR. BRADT, many gardeners in the Niagara District grow these varieties by the "Go as You Please" system. If they will produce ripe grapes in Britain in early September without the hard pruning required by European grape varieties (*V. vinifera*) when grown outdoors in Britain, then they would be of use to the home-gardener. Such vines could cover walls and trellis in the garden and receive an occasional pruning. The crop could be used either for the table or for a few gallons of home-made wine. An easy-to-grow, trouble-free early ripening grape is needed by the British home-gardener. If the flavour of these grapes is not equal to that of cold-house 'Black Hamburgh' that would not proscribe their being grown in Britain.

In the same way, as a melon grower I prefer the flavour of Honeydew and Casaba Melons but I am satisfied with cold-frame Dutch Nets and Tigers when sugared and gingered.

NOTES FROM FELLOWS

Early Illustration of Tulip

VARIOUS species tulips are, as is well known, native to western Europe. It was, however, long and generally believed that the garden tulip, *Tulipa gesneriana*, was first introduced into the West from Turkey, about the middle of the sixteenth century, by BUSBECQ, ambassador from the EMPEROR FERDINAND I TO SULEIMAN THE MAGNIFICENT. But the discovery, in recent years, of several earlier representations of flowers very closely resembling *T. gesneriana* has made it necessary to reconsider the question. One such drawing was shown in *The Daffodil and Tulip Year Book* (1955, p. 119).

In Fig. 49 we reproduce a mural painting of the Virgin and Child

from Coventry Cathedral. In the background are shown three flower-heads which appear to be broken forms of *T. gesneriana*; they bear no resemblance to the slender, pointed flowers of *T. sylvestris*. The style of the painting suggests that it must have been made during the second half of the fifteenth century; and the date is confirmed by the evidence of the architecture, for the picture was painted upon a wall built about 1450, and the erection of a chapel in about 1500 made it necessary to wall the picture up. The painting was disclosed when the Cathedral was bombed in 1941, and was then covered up again for protection. Unfortunately, when after the War the covering was removed, it was found that the painting had completely disintegrated. Our reproduction was made from a copy taken in 1941. The flowers were not coloured, in the strict sense of the word, but shaded with two colours—a greyish light pastel blue near the base and a reddish brown at the tips.

I am indebted to the late MRS. ROBERT GRAHAM for drawing my attention to the painting, and to the PROVOST OF COVENTRY CATHEDRAL and MRS. R. J. HOWARD for obtaining the photograph and for the information given here.

WILFRID BLUNT

Cyclamen neapolitanum

I shall be glad of any help that Fellows can give in solving one of the perplexing problems which Nature so often propounds.

For twenty years I have grown the white variety of *Cyclamen neapolitanum* and it seeds itself prodigally in sun or shade, some of the corms being now the size of Carnera's fist.

Under no circumstances whatever will the type (pink) establish itself, or even grow, in my garden.

Throughout these years I have purchased corms, both dried and in pots: I have obtained seed which has germinated, and planted out seedlings, but, amongst the hundreds of white ones, I still have no pink. The pink corms have been planted in the same situations and in identical conditions to those of the white and, in addition, experiments have been made elsewhere in the garden but they always disappear. My soil is a lightish loam on a subsoil of gravel and is free of lime. I have occasionally given the Cyclamen a light dressing of bone meal. We all know the whimsies of *Gentiana acaulis*, but, apart from my own experience, I have never heard that *Cyclamen neapolitanum* was temperamental.

I long for my woodland paths to be sprinkled with pink cyclamen and any Fellow who can help me to achieve this will have my boundless gratitude.

W. P. KING

Watford,
Herts.

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1958

Camellia japonica 'Elegans' F.C.C. January 21, 1958. According to PAXTON'S *Magazine of Botany*, Vol. 2, 1836, this handsome camellia was raised from seed by MR. CHANDLER, at his Vauxhall Nursery in 1819. It is a hardy evergreen shrub of vigorous habit, with elliptical dark green glossy leaves, 3–5 inches long with serrulate margins and pointed, recurved tips. The flowers are from 10–12 centimetres across, near H.C.C. 21. Carmine in colour, and sometimes blotched and striped with white. The outer petals are rounded in shape, and there is a central mass of petaloids and fertile stamens, giving the flower its characteristic "anemone" form. Exhibited by the Crown Estate Commissioners, The Great Park, Windsor, Berks. (Fig. 42).

Hamamelis mollis 'Pallida' F.C.C. January 21, 1958. This fine variety of the Chinese witch-hazel differs from the type in that the growth is rather more free and the flowers are larger and paler in colour. It forms a deciduous tree, with spreading branches. The leaves are rotund or broadly ovate, obliquely cordate at the base, with widely toothed margins, 4–5 inches long and 2½ inches in width. The strongly fragrant sulphur-yellow flowers are borne in stalkless clusters, from December to February, on the twigs of the previous year's growth. The petals are about 1 inch long, strap shaped, and when newly opened are somewhat crumpled. The lobes of the calyx are covered with hairs on the outside, and are deep maroon red within. Exhibited by the Crown Estate Commissioners, The Great Park, Windsor, Berks. (Fig. 43).

Hamamelis japonica 'Sulphurea' A.M. January 21, 1958. The witch-hazels have long been valued as garden plants, both for the brilliant autumn colour of their leaves, and for their fragrant flowers, which appear in the dead of winter. Rather lighter in habit than the Chinese *H. mollis* is *H. japonica*, of which the present plant is a variety. The leaves are 2–4 inches long, broadly ovate to oblong, with crenulate margins. The pale yellow flowers are borne in dense clusters, during December and January, on the then leafless twigs. The petals are ligulate, very narrow, about ⅝ inch long and much crumpled. The calyx is deep red within and somewhat downy on the outside. Exhibited by the Crown Estate Commissioners, The Great Park, Windsor, Berks. (Fig. 51).

BOOK NOTES

"The Mixed Border." By Christopher Lloyd. London: 8vo. Illus. (Collingridge.) 35s.

The combined shrub and herbaceous border is a topical horticultural subject in these days of high costs.

Mr. Christopher Lloyd does not claim that his mixed border at Great Dixter in Sussex is labour-saving nor does he restrict the plants in his border to just suitable shrubs and hardy perennial plants. He is quite happy to make it a truly "mixed border" including both hardy and half-hardy herbaceous plants, hardy and tender shrubs, bulbs, all kinds of annuals and biennials. From this unlimited variety of plants he

makes his selection, interplanting them to produce the utmost colour for the longest possible period of the year.

The book is written in two parts: the first seventy pages—"Planning and Planting"—gives the essential information necessary for siting, preparing, planting and maintenance of a "Mixed Border". Judging from the wonderful descriptions in the one hundred pages of recommended plants in the second part of the book, the author must not only know his plants well but writes most knowledgeably of his likes and dislikes.

With the exception of the coloured frontispiece, the remaining seventy-eight illustrations are quite good in black and white. The book contains a short list of plants of architectural value for the mixed border, also a brief glossary and index.

Mr. Lloyd has various academic qualifications, amongst them a horticultural degree, and four years' experience as a horticultural lecturer at Wye College. This makes him a highly reliable and qualified person to write from the experience he has gained while creating the "Mixed Border" at Great Dixter.

In such a well-written book it is just a little disappointing to find the "H" omitted when spelling *Genista aethnensis*. The high cost of printing probably accounts for the price of 35*s*., a drawback which may prevent this book occupying the number of bookshelves it deserves.

FRANCIS HANGER

"The Amateur's Greenhouse." By A. J. Macself, V.M.H. 4th revised Ed. Demy 8vo. 302 pp. Illus. (Collingridge.) 21*s*.

The author, Mr. A. J. Macself, was always a careful writer. He took the greatest pains to make everything he wrote not only reliable but easily understood. Since his death the revision has been carried out by Mr. A. G. L. Hellyer who has been mainly concerned with catching up on the scientific side, particularly in pest control and up-to-date heating.

The chapter on constructing a greenhouse in particular is most thoroughly done but it does seem open to question whether this kind of construction is economic today, and the author's instructions as to painting each year inside, and every third out, implies either a great deal of free time on the part of the owner or a heavy and constantly recurring expense if employed labour is used.

One of the main features of the book is the classified list of plants. This is extremely carefully done and in the main covers plants well within the scope of the enthusiastic amateur. It is probable, however, that many of the warm greenhouse subjects described would prove too tender for the minimum winter temperatures maintained today. For example, *Acalypha*, *Caladiums*, *Eucharis*, *Gardenias* and *Marantas* would require a minimum of 50° F.—too high to be economic for the electrically heated, thermostatically controlled houses now becoming popular.

In some ways revision might have gone a little further. It seems a pity to retain old names such as *Libonia floribunda* (now *Jacobinia pauciflora*) and *Lasiandra macrantha* (*Tibouchina semidecandra*) when both plants are now widely known and grown under their correct names. In the case of *Nierembergia* also, *N. hippomanica* should be *N. caerulea*. The plant is not and never was *N. hippomanica* though it was unfortunately first distributed under this name.

African violet enthusiasts will find only one species and one variety mentioned.

Some of the genera included also, e.g. *Monochaetum*, have become so scarce in cultivation that the would-be cultivator is likely to experience some trouble in finding his stocks.

Annuals and biennials in pots, bulbs for pots and forcing shrubs, are all adequately covered; a chapter is devoted to vegetables and salads under glass and another to greenhouse fruits.

Another chapter is devoted to cacti, succulents and carnivorous or insectivorous plants, and finally a month-by-month calendar of operations. The illustrations are well chosen and extremely good.

G. W. ROBINSON

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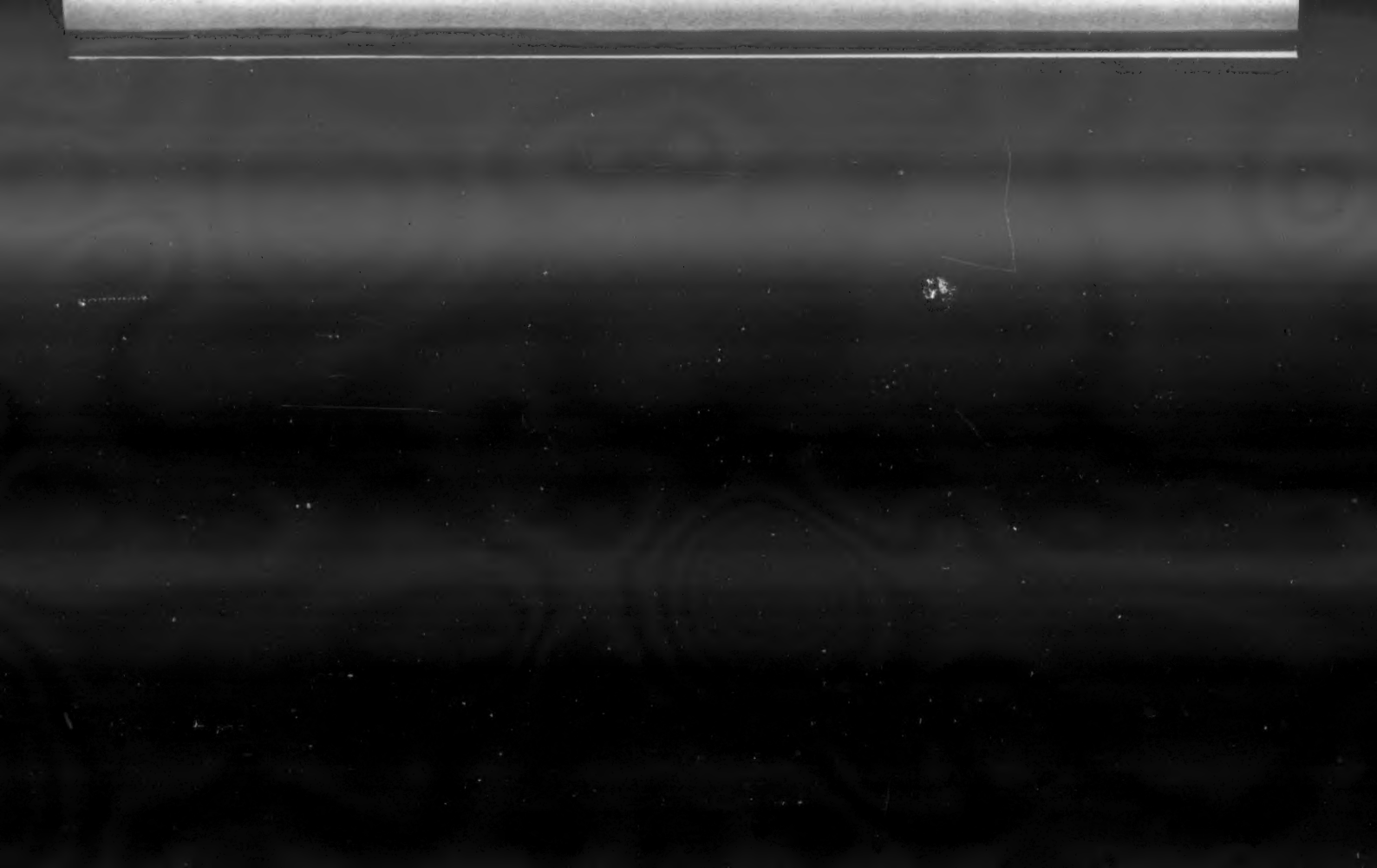

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